



Industrie Service

Choose certainty.  
Add value.

# Validation Report

BHILANGANA HYDRO POWER LIMITED  
VALIDATION OF THE CDM-PROJECT:  
24 MW BHILANGANA - III HYDRO POWER PROJECT

Report No. 1184771

**22 February 2010**

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.
1184771	2008-05-21	6	2010-02-22	-

<b>Subject:</b> Validation of a CDM Project			
<b>Accredited TÜV SÜD Unit:</b> TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 80686 Munich Germany		<b>TÜV SÜD Contract Partner:</b> TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 80686 Munich Germany	
<b>Project Participant (client):</b> Bhilangana Hydro Power Limited, B 37, Sector 1, Noida, Uttar Pradesh, 201301		<b>Project Site(s):</b> Tehri, Garhwal ,Ghuttu, Uttarakhand, India  Diversion weir: 30°33'07" N and 78°48'26" E Power Plant: 30°31'25" N and 78°46'16" E (DPR)	
<b>Project Title:</b> 24 MW Bhilangana - III Hydro Power Project			
<b>Applied Methodology / Version:</b> ACM0002 / version 08		<b>Scope(s):</b> 1 <b>Technical Area(s):</b> 1.1	
<b>First PDD Version:</b> Date of issuance: 04-01-2008 Version No.: 01 Starting Date of GSP 22-05-2008		<b>Final PDD version:</b> Date of issuance: 22-02-2010 Version No.: 05	
<b>Estimated Annual Emission Reduction:</b>		137, 096 tCO <sub>2</sub> e	
<b>Assessment Team Leader:</b> Sven Kolmetz		<b>Further Assessment Team Members:</b> Rajkumar Thakur Sebastian Randig	
<b>Summary of the Validation Opinion:</b> <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> The review of the project design documentation and the subsequent follow-up interviews have been provided TÜV SÜD with sufficient evidence to determine the fulfilment 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. </div> <div style="margin-left: 20px;"> <input type="checkbox"/> The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence to determine the fulfilment 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. </div>			

## Abbreviations

<b>AM</b>	Approved Methodology
<b>BM</b>	Build Margin
<b>BHPL</b>	Bhilangana Hydro Power Limited
<b>CAR</b>	Corrective Action Request
<b>CDM</b>	Clean Development Mechanism
<b>CDM EB</b>	CDM Executive Board
<b>CER</b>	Certified Emission Reduction
<b>CM</b>	Combined Margin
<b>CMP</b>	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
<b>CR / CL</b>	Clarification Request
<b>DNA</b>	Designated National Authority
<b>DOE</b>	Designated Operational Entity
<b>EF</b>	Emission Factor
<b>EIA / EA</b>	Environmental Impact Assessment / Environmental Assessment
<b>ER</b>	Emission Reduction
<b>FAR</b>	Forward Action Request
<b>GHG</b>	Green House Gas(es)
<b>GoU</b>	Government of Uttarakhand
<b>GSP</b>	Global Stakeholder Process
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IRL</b>	Information Reference List
<b>IRR</b>	Internal Rate of Return
<b>KP</b>	Kyoto Protocol
<b>MP</b>	Monitoring Plan
<b>NGO</b>	Non Governmental Organisation
<b>OM</b>	Operational Margin
<b>PDD</b>	Project Design Document
<b>PP</b>	Project Participant
<b>TÜV SÜD</b>	TÜV SÜD Industrie Service GmbH
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>VVM</b>	Validation and Verification Manual

<b>Table of Contents</b>	<b>Page</b>
1 INTRODUCTION .....	5
1.1 Objective .....	5
1.2 Scope .....	5
2 METHODOLOGY .....	6
2.1 Appointment of the Assessment Team .....	7
2.2 Review of Documents .....	8
2.3 Follow-up Interviews.....	8
2.4 Further Cross-check.....	8
2.5 Resolution of Clarification and Corrective Action Requests .....	9
2.6 Internal Quality Control.....	9
3 SUMMARY .....	10
3.1 Approval .....	10
3.2 Participation.....	10
3.3 Project design document.....	10
3.4 Project description .....	11
3.5 Baseline and monitoring methodology .....	11
3.5.1 Applicability of the selected methodology .....	11
3.5.2 Project boundary.....	11
3.5.3 Baseline identification .....	12
3.5.4 Algorithm and/or formulae used to determine emission reductions .....	13
3.5.5 Project emissions.....	14
3.5.6 Leakage .....	14
3.5.7 Emission Reductions .....	14
3.6 Additionality .....	14
3.6.1 Prior consideration of the clean development mechanism .....	15
3.6.2 Identifications of alternatives .....	17
3.6.3 Investment analysis .....	17
3.6.4 Common practice analysis.....	26
3.7 Monitoring plan.....	27
3.8 Sustainable development .....	28
3.9 Local stakeholder consultation .....	28
3.10 Environmental impacts .....	28
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS .....	29



5	VALIDATION OPINION.....	30
---	-------------------------	----

Annex 1: Validation Protocol

Annex 2: Information Reference List

## 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 Executive Board (CDM-EB). The ultimate decision on the registration of a proposed project activity rests at the CDM-EB and the Parties involved.

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

#### **24 MW Bhilangana - III Hydro Power 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 and modalities and procedures for the CDM
- 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 and 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)
- Baselines and monitoring methodologies (including GHG inventories)
- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope
- Applicable environmental and social impacts and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The validation is not meant to provide any consulting towards the project participant (PP). However, stated requests for clarifications, corrective actions and/or forwards actions may provide input for improvement of the project design.

Once TÜV SÜD receives a first PDD version, it is made publicly available at the UNFCCC webpage and at TÜV SÜD's webpage for starting a 30 day global stakeholder process (GSP). In case of any request a PDD might be revised (under certain conditions the GSP could be repeated) and the final PDD will form the basis for the final evaluation as presented in this report. Information on the first and the final PDD version is presented in 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 cannot 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 applies standard auditing techniques to assess the correctness of the information provided by the project participants. The assessment is based on the “Clean Development Mechanism Validation and Verification Manual” version 01. The work starts with appointment of team covering the technical scope(s), sectoral scope(s) and relevant host country experience for evaluating the CDM project activity. Once the project is made available for the stakeholder consultation process, members of the team carry out the desk review, follow-up actions, resolution of issues identified and finally preparation of the validation report. The prepared validation report and other supporting documents then undergo an internal quality control by the CB “climate and energy” before submission to the CDM-EB.

In order to ensure transparency, assumptions are clear and explicitly stated; the background material is clearly referenced. TÜV SÜD developed a methodology specific protocol customised for the project. 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 and any adjustment made to the project design.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below.

Validation Protocol Table 1: Conformity of Project activity and PDD				
Checklist Topic / Question	Reference	Comments	GSP PDD	Final PDD
<i>The checklist is organised in sections following the arrangement of the applied PDD version. Each section is then further sub-divided. The lowest level constitutes a checklist question / criterion.</i>	<i>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.</i>	<i>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 <b>Request</b> has to be substantiated within this column</i>	<i>Conclusions are presented based on the assessment of the first PDD version. This is either acceptable based on evidence provided (✓), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). <b>Clarification Request (CR)</b> is used when the validation team has identified a need for further clarification. <b>Forward action request</b> to highlight issues related to project implementation that require review during the first verification.</i>	<i>Conclusions are presented in the same manner based on the assessment of the final PDD version and further documents including assumptions presented in the documentation.</i>

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

In case of a 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 1	Explanation of the Conclusion for Denial
<i>If the final conclusions from table 2 results in a denial the referenced request should be listed in this section.</i>	<i>Identifier of the Request.</i>	<i>This section should present a detail explanation, why the project is finally considered not to be in compliance with a criterion with a clear reference to the requirement which is not complied with.</i>

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

## 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 "climate and energy". The composition of an assessment team has to be approved by the Certification Body (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 scope	Coverage of technical area	Host country experience
Sven Kolmetz	ATL	☑	☑	
Rajkumar Thakur	GHG-A	☑		☑



Sebastian Randig	GHG-A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
------------------	-------	-------------------------------------	-------------------------------------	--

**Sven Kolmetz** is physicist and head at the department “TÜV Carbon Management Service” located in the head office of TÜV Süddeutschland in Munich. Furthermore he is officially authorized expert in the verification of GHG emissions in the framework of the European Emission Trading Scheme. Before entering TÜV SÜD he worked as energy consultant for industrial companies and as consultant for the German Federal Government on instruments for the reduction of GHG emissions.

**Rajkumar Thakur** is GHG Auditor at TÜV SÜD South Asia and also a certified lead auditor for environmental management systems (according to ISO 14001). He holds a post-graduate degree in Energy Efficiency. Before joining TÜV SÜD South Asia, he worked on energy conservation, Renewable energy technology (especially in the renewable power sector), cement blending and waste heat recovery projects. Mr. Rajkumar Thakur has received extensive training in the CDM validation and verification processes and has already participated in several CDM project assessments.

**Sebastian Randig** is a GHG auditor for environmental management systems at the “Carbon Management Service” in the head office of TÜV Industrie Service GmbH, Germany. He holds a M.Sc. degree in Renewable Energy and has gathered experience in planning and installing renewable energy installations before joining TÜV SÜD. He has received training in the CDM validation process and participated in several CDM project assessments.

## 2.2 Review of Documents

A first version of the PDD was submitted to the DOE in May 2008. The first PDD version submitted by the PP and additional background documents related to the project design and baseline were reviewed to verify the correctness, credibility and interpretation of the presented information, furthermore a cross check between information provided and information from other sources (Calculation sheet) have been done 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 between 25<sup>th</sup> and 27<sup>th</sup> May, 2008, TÜV SÜD performed physical site inspection and on-site interviews with project stakeholders to confirm relevant information and to resolve issues identified in the first document review. The table below provides a list of all persons interviewed in this context.

Name	Organisation
Mr. Rajesh Jindal	Bhilangana Hydro Power Ltd.
Mr. Amit Kumar Agarwal	Bhilangana Hydro Power Ltd.
Mr. Sachin Pahuja	Bhilangana Hydro Power Ltd.
Suchi Malhotra	Consultant

## 2.4 Further Cross-check

During the validation process, the audit team also cross checked information provided in the PDD and information from sources other than that provided by the PP. The audit team performed an independent background investigation through search over the internet. Reference(s) to available in-

formation related to similar projects or technologies as the CDM project activity has been made. The documentation has also been reviewed against the approved methodology applied to confirm the appropriateness of formulae and correctness of calculations.

## **2.5 Resolution of Clarification and Corrective Action Requests**

The objective of this phase of the 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 conclusion on the project design. The CARs and CRs raised by TÜV SÜD were resolved during communication between the PP and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are documented in more detail in the validation protocol in annex 1.

The final PDD version-04 that was submitted in May 2009 serves as the basis for the final assessment presented herewith. Changes are not considered to be significant with respect to the qualification of the project as a CDM project based on the two main objectives of the CDM, i.e. to achieve a reduction of anthropogenic GHG emissions and to contribute to a sustainable development.

## **2.6 Internal Quality Control**

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

After confirmation of the PP the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

### **3 SUMMARY**

The assessment work and the main results are described below in accordance with the VVM reporting requirements. The reference documents indicated in this section and Annex 1 are stated in Annex 2.

#### **3.1 Approval**

The project participant Bhilangana Hydro Power Limited (BHPL) of India (host country) meets the requirements to participate in the CDM. The letter of approval referenced as 4/1/2008-CCC, dated 17<sup>th</sup> March 2008, from Indian DNA has been received [IRL # 34]. TÜV SÜD received this letter from the project participant directly. The authenticity check of the submitted LoA has been done by comparison with LoAs of the country issued for other activities. Thus TÜV SÜD concludes that the given one is authentic.

Furthermore, after checking the provided LoA, TÜV SÜD confirms that the letter refers to the precise proposed CDM project activity title in line with the title in the PDD "24 MW Bhilangana - III Hydro Power Project".

The Host Country Approval letter also confirms that the proposed CDM project activity contributes to the sustainable development in India (host country). Based on the information given in the letter, TÜV SÜD considers the approval as unconditional with respect to the items.

The LoA has been issued by the DNA, "National Clean Development Mechanism (CDM) Authority (Ministry of Environment and Forests)", India.

TÜV SÜD considers the requirements of the VVM (§§ 45-48) to be complied with.

The LoA does not specify a version number of the PDD or validation report. The corresponding references included to LoA, PDD and validation report are consistent.

#### **3.2 Participation**

The participant of the project activity has been confirmed by the issued LoA. The means of validation were equivalent to those described in section 3.1 in regard to the approval process of the project activity.

#### **3.3 Project design document**

As result of an in-depth review of the submitted documents TÜV SÜD can confirm that the PDD is compliant with relevant form and guidance by UNFCCC. The most recent version of the PDD form was used.

TÜV SÜD considers that the guidelines for the completion of the PDD in their most recent version have been followed. Relevant information has been provided by the participants in the applying PDD sections. Completeness was assessed through the protocol included in Annex 1 of this report.

TÜV SÜD confirms that the included information sufficiently covers all relevant items, is accurate and provides the reader with a clear understanding of the nature of the project activity.

### 3.4 Project description

The description of the recent situation, the project activity and the baseline as provided under section A of the PDD has been verified during an on-site visit and by reviewing the supporting documents and back-ground information accessible on publicly available sources (e.g. information on the Indian electricity grid). In particular the following information, which is essential for the understanding of the activity, can be confirmed herewith.

The following description of the project as per the PDD has been verified during the on-site audit:

The project activity "Bhilangana - III (B-III)" is a run-of-the-river 24 MW Hydro Power Project located at Village Ghuttu, Tehsil Ghansali, District Tehri, Uttarakhand State, India. It contemplates utilization of waters of Bhilangana River, a tributary of the river Bhagirathi, for setting up an environmentally benign project for generation of electricity. The project is essentially a run-of- the river reservoir scheme having a power density of 16,849 W/ m<sup>2</sup>, expected to generate 169,171 MWh electricity per year (IRL5) This data is computed by a third party and does thus comply with current EB guidance on the load factor of power plants (EB48, Annex11, §3(b)). Construction work at project site has been started and the project activity is expected to start generation of power from April 2010. The geographical and physical boundary of the project is clearly identifiable and information pertaining to the grid is provided and is publicly available.

The information presented in the PDD on the technical design is consistent with the actual planing and implementation of the project activity as confirmed by:

- Review of data and information (see annex 2) An on-site visit has been performed and relevant stakeholder and personnel with knowledge of the project were interviewed.
- Finally information related to similar projects or technologies as the CDM project activity .have been used to confirm the accuracy and completeness of the project description.

In light of the above, TÜV SÜD confirms that the project description as included to the PDD is sufficiently accurate and complete in order to comply with the requirements of the CDM.

### 3.5 Baseline and monitoring methodology

#### 3.5.1 Applicability of the selected methodology

The approved methodology ACM0002, Version 08 has been applied for the project by the project participant. The project activity meets all the applicability conditions of the approved methodology. The Methodology specific protocol included as Annex 1 documents the assessment process, the result on the compliance check as well as the relevant evidence.

TÜV SÜD confirms that the chosen baseline and monitoring methodology is applicable to the proposed project activity. Emission sources which are not addressed by the applied methodology and which are expected to contribute more than 1% of the overall expected average annual emissions reduction were not identified.

#### 3.5.2 Project boundary

The Project boundary includes the physical and geographical site of the project power plant and all power plants connected physically to the Northern regional grid that the "CDM project power plant is connected to". The project boundary is as per the methodology and the same has been validated based on the document review and on-site visit.

The most relevant documentation assessed in order to confirm the project boundary are following:

1. Northern regional grid data (CEA data, version-03)
2. The Central Electricity Authority (CEA), under the Ministry of Power, Government of India, (<http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>)

The same have been validated during the validation process using standard audit techniques, further details of any observation are transparently presented in the annex 1."

Hence TÜV SÜD confirms that the identified boundary and the selected sources and gases as documented in the PDD are justified for the project activity.

### 3.5.3 Baseline identification

The list of alternatives presented in the PDD is complete. The project activity is a newly installed run-of-river hydro power project. It is not a modification or retrofit of an existing electricity generation facility. Hence, as per the methodology ACM0002 version 8, the baseline scenario is the following:

*Electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".*

Hence, as per the methodology ACM002/version 07, the baseline is identified as "the kWh produced by the renewable generating unit multiplied by the Baseline Emission Factor" calculated in a transparent and conservative manner. For the calculation of the Baseline Emission Factor, option (a) – A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the "Tool to calculate the emission factor for an electricity system (Version 01.1)" – is chosen. The Northern grid has been considered as the baseline since the Project activity will replace use of fossil fuel by existing power plants in the grid for supply of power. The Central Electricity Authority (CEA), under the Ministry of Power, Government of India, has estimated the Operating & Build Margin for the Northern grid, which is publically available.

In line with the methodology, the combined margin emission factor for the Northern grid has been calculated to be 0.8104 tCO<sub>2</sub>e/MWh, the emission factor has been sourced from Central Electricity Authority Database "CO<sub>2</sub> Baseline Database for the Indian Power Sector User Guide - Version 3.0 Database", using a combined margin approach consisting 50% operating margin and 50% build margin approach. The operating margin has been determined to be 0.9926 tCO<sub>2</sub>/MWh and the build margin to be 0.6283 tCO<sub>2</sub>/MWh. It has been also ensured that the same data were available at the commencement of validation.

DOE confirms that the CEA database is an official publication of the Government of India for the purpose of CDM baselines and the OM in the CEA database is calculated using the simple OM approach based on the generation weighted average emissions per electricity unit of all fossil-fuelled generating sources serving the system over a three year period of 2004-2005, 2005-2006 and 2006-2007, BM is calculated ex-ante based on the 20% most recent capacity additions in the grid based on net generation for the year 2006-2007 as described in ACM0002. The input values to calculate the emission factor as indicated in the PDD have been validated and found to be supported reasonably by evidences. Furthermore the grid emission factor has been cross-checked with the data base provided by CEA:

<http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>

The input values as indicated in the PDD have been validated and found to be supported reasonably by evidences. All documentation is correctly quoted and data is consistently transferred to the calculations. The sectoral/national circumstances are considered reasonable and the baseline methodology has been correctly applied.

TÜV SÜD has determined that no reasonable alternative scenario has been excluded.

Based on the validated assumptions on calculations TÜV SÜD considers that the identified baseline scenario is reasonable.

TÜV SÜD confirms that all relevant CDM requirements, including relevant and / or sectoral policies and circumstances, have been identified correctly taken into account in the definition of the baseline scenario.

A verifiable description of the baseline scenario has been included to the PDD.

In regard to item 86 of VVM, TÜV SÜD confirms that:

1. All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
2. All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
3. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
4. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
5. The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

### **3.5.4 Algorithm and/or formulae used to determine emission reductions**

TÜV SÜD has assessed the calculations of project emissions, baseline emissions and leakage and emission reductions. Corresponding calculations were carried out based on calculation spreadsheets. The parameters and equations presented in the PDD and further documentation have been compared with the information and requirements presented in the methodology and respective tools. The equation comparison has been made explicitly following all the formulae presented in the calculation files.

The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been checked and confirmed.

Based on the information reviewed it can be confirmed that the sources used are correctly quoted and interpreted in the PDD.

The values presented in the PDD are considered reasonable based on the documentation reviewed, further references and the result of the interviews.

The baseline methodology has been correctly applied following the requirements.

The estimated baseline emissions can be confirmed as the same have been replicated by the audit team using the information provided.

Detailed information on the verification of the parameters used in the equations can be found in the annex 1. The algorithms for the determination of baseline emissions are discussed in the following sections.

#### **3.5.4.1 Baseline emissions**

The calculation of the baseline emissions follows the procedures described in the applied methodology. The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to (grid); the same has been adopted as the baseline CO<sub>2</sub> emission factor and will be estimated ex-ante.



The formulae required for the determination of baseline emissions have been correctly presented and applied, enabling a complete identification of parameters to be used and / or monitored. It is confirmed that the calculation for the estimation of baseline emissions has been verified and that the figures presented in the final PDD and excel file deemed to be reasonable.

### **3.5.5 Project emissions**

Since the BHPL project activity is a run-of-river hydro project that results in a new reservoir with power density of  $16,489 \text{ W/m}^2$ , (greater than the threshold value of  $10 \text{ W/m}^2$ ), hence according to the chosen baseline methodology ACM0002/ Version 08, project emissions are nil.

### **3.5.6 Leakage**

Since the project activity is a run-of-river hydro project and according to ACM0002 Version 08, the main emissions potentially giving rise to leakage in the context of electricity sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects). Project participants do not need to consider these emission sources as leakage in applying this methodology. Project activities using ACM0002 Version 08 shall not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario. Thus, the leakage emissions considered to be nil.

### **3.5.7 Emission Reductions**

The emission reduction calculations presented in the final PDD are according to the methodology and are deemed to be conservative.

In summary, the calculation of the baseline emissions and the emission reductions, respectively, can be considered as replicable and correct.

## **3.6 Additionality**

The prior and on-going CDM consideration as well as the demonstration of additionality were applied correctly and demonstrated clearly that this project activity is not a baseline scenario and that the emission reductions hence are additional. The individual steps are discussed below.

The additionality of the project has been presented in the PDD using following approach:

The "Tool for the demonstration and assessment of additionality, version 05.2"., utilizing step 2 of the tool. The approach used in the PDD has been assessed first based on a document review, where following relevant documents have been reviewed:

The assessment team has reviewed all the documents provided by the project participants to prove the additionality. The proofs for the early consideration of applying for CDM to support project activities have been verified: the project participant have demonstrated that the decision was taken in an early stage. In particular has been verified that the Directorate Decision to apply for CDM (February 2006) has been taken on the basis of the Preliminary Design Report, finalized on January 2006. The purchasing contract for the main equipments (turbine and generator) has followed on July 2007. The project participants have demonstrated through evidences and official documents that the sequence of the events is coherent and reliable under the additionality point of view. Hence, we are confident that CDM has been considered before the starting date of the project.

On site the additionality has been discussed principally with: Mr. Amit Kumar Agarwal and Mr. Sachin of Bhilangana Hydro Power Ltd.

Furthermore some documents have been reviewed on-site (for details see annex 2).

Finally the data, rationales, assumptions, justifications and documentation provided have been checked using local knowledge and sectoral and financial expertise, the same has been cross checked by:

- Correspondence made with various banks on term loan [IRL# 23]
- Care rating evidence rationale [IRL# 25]
- Extracts of DPR for assumptions in investment analysis, total costs of the project and for values of energy generation [IRL#57, 58, 59]
- WACC Benchmark calculation sheet and project IRR calculation sheet [IRL# 55, 61]

Based on this validation steps we can confirm that the documentation assessed is appropriate for this project.

### 3.6.1 Prior consideration of the clean development mechanism

The starting date of the project activity is determined to be 19th March 2007 [IRL#49], which is before 02 August 2008 and also before the GSP. The original of the documentation presented has been revised and cross check based on interviews with Mr. Amit Agarwal. Hence the documents such as civil contract with Srinivasa Constructions Limited (marking the projects start date on 19<sup>th</sup> March 2007) and board approval prior that, indicating the need for the CDM support to implement the project can be considered appropriate to confirm the prior CDM consideration. The project activity was one of the first projects which allocated to IPP under competitive bidding process would face various financial, technological and intituitional barriers. The project proponent was aware of the benefits in terms of the possible revenues through CDM to mitigate risks associated with investments in a hydro power project and therefore considered CDM incentive for the project activity at the financial planning stage as it was the decisive factor in the decision to proceed with the project. Since the start date was before the validation, information on the delay and early consideration of CDM was provided and the same has been validated in accordance with EB-41, Annex-46, Para-5, as follows:

Description	Timeline	Supporting Documents	IRL # (Annex 2)	Auditor conclusion
Internal memo indicating first consideration of CDM	22 <sup>nd</sup> Feb 2006	Board resolution	21	Proving the awareness of CDM at the very early stages of the projects feasibility assessment.
Email from the CDM consultants to BHPL with CDM advisory proposal for services related to BHPL	15 <sup>th</sup> March 2007	Proposal from consultant to BHPL	39	Indicating the search for CDM consultant to secure CDM financing.
Signing of civil construction Agreement with Srinivasa Constructions Limited	19th March 2007	Contract agreement	49	Marking the earliest project start date in line with CDM glossary in a conservative manner.



Description	Timeline	Supporting Documents	IRL # (Annex 2)	Auditor conclusion
Investment decision with equipment supplier	10 <sup>th</sup> July 2007	Contract agreement	9,10	Second major contract, underlining that above contract of 19 <sup>th</sup> March 2007 shall be considered as start date.
Engagement letter between BHPL and the CDM consultants for CDM services for Bhilangana III small hydro project	2 <sup>nd</sup> August, 2007	Engagement letter between BHPL and CDM consultant	40	Indicating continued efforts to secure CDM financing
PPA between BHPL and Tata Power Trading Company Ltd	27 <sup>th</sup> December 2007	Power Purchase Agreement	18	Milestone in the projects implementation.
Order to DOE	8 <sup>th</sup> April 2008	Contract	-	Indicating continued efforts to secure CDM financing
GSP upload	22 <sup>nd</sup> May 2008	UNFCCC website	-	Indicating continued efforts to secure CDM financing

The documentation submitted as proofs to justify these events demonstrated that the project proponents had considered CDM since the inception of the project and continuing and real actions were taken to secure CDM status for the project in parallel with its implementation.

The project start date has been taken as per the EB guidance on starting date of project activity (EB41, Para 67) which refers in this case to the date of the contract for civil works signed with M/s Srinivasa Constructions Limited on 19/03/2007 [IRL #49]. The evidence had been validated at the time of site audit and same was listed in Information Reference List (IRL) as annex to the validation report. This date represents start of construction of the project activity and is the earliest date indicating commencement of project implementation thus complying with the definition of "starting date" set out in the *CDM Glossary of Terms*, Version 05.

The payments made for 8.4 MW and additional payment made when capacity was increased to 24 MW represent the compensation for expenditure incurred by the Government of Uttaranchal (GOU) for preliminary investigation, site selection, initial feasibility report and related activities for the project undertaken by them before allocation to project developer.

The payment of premium thus does not represent the project developer's firm intent or commitment to implement the project. Further, in accordance with EB guidelines "*the contracting of services /payment of fees for feasibility studies or preliminary surveys should not be considered in the determination of the start date as they do not necessarily indicate the commencement of implementation of the project*". Accordingly, the premium payment was not considered as a start date.

Regarding the natures of the premium payment made to the Government of Uttarakhand (GOU) it has been validated that the allotment of project/site is in accordance with the "Policy on Hydro Power Development by Private Sector in the State of Uttaranchal" [IRL #38]. Under this policy, there is a requirement of payment of upfront premium per MW in case of each project (subject to a minimum threshold premium of INR 0.5 million/MW) from qualified project developers to Uttaranchal Jal

Vidyut Nigam Ltd. which is the nodal agency appointed by the GOU. The Letter of Award (LoA) is issued to the qualified project developer and is subsequently required to sign the Project Development Agreement (PDA) with the GoU under which it is required to deposit the premium amount.

For further information, the total premium amount (for the entire 24 MW) paid to GOU by BHPL is INR 22.255 Million which is 1.17% of the entire estimated project cost (INR 1900 Million). The amount is deemed insignificant as a financial commitment for the project and further as indicated above, does not indicate the commencement of implementation of project. Over and above had project participant wished to handover the project back to GOU, they would have got INR 10.255 Million back after deduction of INR 12 million @ 0.5 million/MW as threshold of premium as per "Policy on Hydro Power Development by Private Sector in the State of Uttaranchal" [IRL #38].

It has also been validated that either the date of payment i.e. 25.09.2003 of initial premium amount is corresponding to 8.4 MW, after which the detailed techno-economic viability for the project was carried out, or the date of payment i.e. 25.05.2006 of additional premium [IRL #54], worked out on the basis of enhanced capacity (24 MW) paid under protest, does not represent firm commitment of the finance towards implementation of the project. These were preliminary expenses prior to start of the project activity, which is common for any hydro power project in Uttaranchal as per "Policy on Hydro Power Development by Private Sector in the State of Uttaranchal" [IRL #38]

Thus it is evident that the premium payment referred in the review query does not represent firm commitment of any project developer for the implementation of a project.

### 3.6.2 Identifications of alternatives

The output of the project is electricity generation and feeding the same to the grid thereby displacing equivalent units of power generated by fossil fuel dominated grid.

The list of alternatives to supply the outputs mentioned above, which is presented in the PDD includes the project activity undertaken without being registered as CDM project.

The rest of the alternatives, namely "the continuation of the current situation in the Northern grid without project activity and equivalent amount of energy is being produced by the grid electricity system through its currently running power plants (which are mostly thermal) and/or by new capacity addition to the grid".. .and "equivalent power generation using other sources of renewable energy" presented do include all plausible scenarios taking into account the local and sectoral situations for the outputs mentioned.

All the alternatives are in compliance with all applicable legal and regulatory requirements as:

- the implementation of project activity is a voluntary initiative and is not mandatory or a legal requirement;
- the Electricity Act 2003 does not restrict or empower any authority to restrict the fuel choice for power generation;
- the applicable environmental regulations do not restrict the use of hydro energy; and
- there is no legal requirement on the choice of a particular technology.

Hence the list of alternatives is considered to be complete. For the same barrier analysis has been used to demonstrate the additionality.

### 3.6.3 Investment analysis

#### Suitability of Financial Indicator:

The Project proponent has chosen the Project IRR as the financial indicator and in accordance with the "Guidance on the assessment of Investment Analysis" paragraph 3, which states that '*a minimum period of 10 years and a maximum of 20 years period of assessment will be appropriate*' has estimated the IRR for a 10 year period which is considered appropriate and more suitable considering the proportion of debt (70% of project cost, [IRL #56]) and repayment period (10 years). It may be noted that the debt equity ratio of 70:30 and a repayment period of 10 years is in accordance with the Indian Renewable Energy Development Agency's (IREDA - the nodal agency for financing renewable energy projects in India), financing norms relating to maximum moratorium, repayment period and minimum promoter contribution.\* The fair value of assets which includes both the book value of assets at the end of assessment of year (i.e. 10<sup>th</sup> year) and the value of other non depreciable assets (land) have been included as the cash inflow in the terminal year of assessment in accordance with paragraph 4 of the "Guidance on the assessment of Investment Analysis".

### **Suitability of Benchmark**

The project proponent has calculated the value of benchmark to be 13.18%. The DOE has assessed and verified the reliability and creditability of data, rationales, assumptions, justifications and documentation provided by project participants to support the appropriateness of benchmark adopted in the project activity. The parameters checked during this assessment and the conclusions drawn are as documented below.

The project proponent has chosen Weighted Average Cost of Capital (WACC) as the benchmark for comparison against the financial indicator, Project IRR. WACC for the project has been derived from the cost of equity and the cost of debt by taking the respective proportion of debt and equity in the financing pattern as weights, representing the opportunity cost of capital invested. The selection of this benchmark is in conformance with 'Guidelines on the Assessment of Investment Analysis', Version 03, paragraph 12, which states that '*...weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR*' (Verified and considered to be appropriate in context of VVM, paragraph 110 a).

### **Appropriateness of the benchmark calculation**

Sub-step 2(b) of the additionality tool, paragraph 6, directs the project proponent to base the financial analysis on 'parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer.' The rationale, calculation methodology and source of assumptions for the computations of WACC for the project are in conformance with this guideline.

In computing the cost of equity and cost of debt for WACC calculation, as permitted by the additionality tool, the project proponent has identified the *Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type* [paragraph 6(a) of sub-step 2b)] as the benchmark for cost of equity. The appropriate cost of debt has been taken as the *Prime lending rate* prevailing at the time of investment decision adjusted to tax rate in order to serve as a benchmark comparable to post tax IRR computations.

The Capital Asset Pricing Model (CAPM) approach has been used to determine the expected return on equity. In order to incorporate the risk of the project activity sector in the calculation of risk premium, Beta (B) value appropriate to the project activity has been chosen, by considering beta values of listed electricity generating companies in India. (Verified and considered to be appropriate in context of VVM, paragraph 110 (b))

### **Assessment of accuracy and suitability of parameters and assumptions used in calculating WACC**

---

\* <http://www.ireda.in/pdf/Financing%20Norms.pdf>

In conformance with paragraph 13 of Guidelines on the Assessment of Investment Analysis', Version 03, the project proponent has calculated WACC taking values from publically available data sources as tabulated below.

Parameter Value	Source of Information	Values used	Validation justification
Corporate Tax Rate (MAT)	Income Tax Act	8.415%	<p>The power projects in India typically pay MAT in the initial 10 years of their operation owing to tax exemption as per the provisions of the Income Tax Act. Hence assuming MAT rate for the year 2005-06 applicable during the investment decision of the project is appropriate.</p> <p>The MAT rate has been verified from official website of Income Tax Department, Department of Revenue, Ministry of Finance-</p> <p><a href="http://law.incometaxindia.gov.in/TaxmannDit/DisplayPage/dpage2.aspx?md=24&amp;typ=cn&amp;yr=2005">http://law.incometaxindia.gov.in/TaxmannDit/DisplayPage/dpage2.aspx?md=24&amp;typ=cn&amp;yr=2005</a></p>
Debt Equity Ratio	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004; [IRL #56]; IREDA Financing Norms	70:30	<p>In case of all generating stations in India (Renewable and Non-Renewable), debt–equity ratio of 70:30 is used. This fact has been validated from the following sources:</p> <ul style="list-style-type: none"> <li>- UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 (state specific regulations)</li> <li>- CERC (Terms and Conditions of Tariff) Regulations (Central Regulations)</li> <li>- Indian Renewable Energy Development Agency's Financing Norms for small hydro projects (<a href="http://www.ireda.in/pdf/Financing%20Norms.pdf">http://www.ireda.in/pdf/Financing%20Norms.pdf</a>)</li> </ul> <p>Since these documents were available and/or applicable during the investment decision, they are considered to be appropriate.</p>
Cost of Debt	Average RBI PLR February 2006	9.62 %	<p>The Tool for demonstration and Assessment of Additionality” and the “Guidance on Assessment of Investment Analysis” clarify that the benchmark for project with more than one potential developer should not be based on project specific parameters but should represent the standard rates in the market. Hence, the actual interest on term loan applicable to the project proponent has not been considered and the cost of debt is based on the average prime lending rate (10.5%) applicable at the time of investment decision.</p> <p>Has been verified from RBI archives-</p> <p><a href="http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/69504.pdf">http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/69504.pdf</a></p> <p>Considered to be appropriate and applicable at the time of investment decision.</p>
Market Return	Historical returns of BSE	22.19%	<p>BSE 500 is a well diversified Index which constitutes largest and most actively traded stocks in the Indian market, thus</p>

	500 Index since Inception till the time of investment decision		<p>reducing the unsystematic risk associated with the market. Hence the choice of Index has been considered to be appropriate.</p> <p>Has been verified from BSE website- <a href="http://www.bseindia.com/histdata/hindices.asp">http://www.bseindia.com/histdata/hindices.asp</a></p> <p>Considered to be appropriate and applicable at the time of investment decision</p>
Risk Free Rate of Return	RBI Annual Report - Weighted Average YTM for 2005-06	7.34%	<p>The weighted average yield of Government of India Securities during the year 2005-06 provided by Reserve Bank of India is considered as an appropriate risk free rate applicable at the time of investment decision.</p> <p>Verified from RBI website- <a href="http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/72360.pdf">http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/72360.pdf</a></p>
Beta	<p>Betas from Bloomberg</p> <p>Company statistics from Annual Reports of the Companies accessed from their websites and cross checked with reliable websites like <a href="http://www.moneycontrol.com">www.moneycontrol.com</a></p>	0.9526	<p>The project proponent has calculated and used average asset beta derived from the equity beta values accessed from Bloomberg. Since the asset beta does not take into account the financial leverage which can vary across companies, it is considered to be more appropriate and conservative.</p> <p>The unlevered beta has been calculated using:</p> <ul style="list-style-type: none"> <li>• Three year beta values of power generation companies in India listed on the stock exchange at the time of investment decision</li> <li>• Marginal Tax Rate and D/E ratio of power generation companies derived from publically available company statistics</li> </ul> <p>Equity Beta values have been verified with Bloomberg screenshots. The beta value is deemed to appropriately reflect the risk profile of investments in the power sector (In conformance with 'Guidelines on the Assessment of Investment Analysis', Version 03, paragraph 15).</p> <p>Considering that the beta is even lesser than 1 (which represents the market risk) this beta is deemed to be conservative.</p>

Based on the above data, the calculations for WACC for benchmark computation have been checked by the verification team and found to be conservative and acceptable. It can be reasonably assumed that no investment would have been made in this type of project (owing to the associated risks) if the rate of return was lower than the above determined benchmark rate of 13.18% (VVM Para 110 c).

### IRR Analysis

The values of the parameters used to calculate the Project IRR have been referred from the Detailed Project Report (DPR) prepared by reputed external third party TCE Consulting Engineers Limited. According to para 111 of VVM, the following have been checked:

1. Timing of the preparation of DPR: The DPR was finalized and submitted to the State Government of Uttaranchal for their approval on 30<sup>th</sup> January 2006 (BHPL's letter dated 30/01/2006 [IRL #06]).



2. Timing of the investment decision (Board Resolution) – The decision to proceed with the proposed project activity was taken in the meeting of the Directors of BHPL on 22/02/2006 (Ref: Minutes of the meeting of Board of Directors dated 22/02/2006 [IRL #21]).

Since the period of time between the finalization of the DPR and the investment decision is roughly twenty three days, which can be considered to be sufficiently short, we would like to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed (para 111 a).

The DOE has verified the values used in the IRR model submitted by the project proponent along with the PDD and its annexes. The DOE would like to confirm that the values of gross generation (based on 50% dependable year), auxiliary consumption (0.5%) and transformation losses (0.5%) used in the PDD for the estimation of emission reductions are fully consistent with the assumptions in IRR and are based on the values given in the DPR [IRL #57]. The IRR analysis assumes capacity index of 100% in conformance with the emission reduction calculations in the PDD, which is conservative as against the assumption of 90% capacity index in the first year and 95% from the subsequent years of project operation in the DPR.

The DOE did not observe any inconsistency in the values used in the IRR estimation, the PDD and those assumed in the DPR (VVM para 111 b).

The DOE has further conducted a cross check of the input values in the DPR with the authentic and publically available information in accordance with the Guidance on Investment Analysis (Version 1.1, Para 6) as follows (VVM Para 111c):

Input Parameters In IRR Sheet and DPR	Value used	Cross reference/Source	Remarks on the validity of input value at the time of investment decision
Tariff Computation	Tariff comprises of Annual Capacity Charges and Primary Energy Charges	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004; [IRL #56]	In India, activities in the electricity sector such as generation, distribution, transmission and trading of power come under the purview of a comprehensive legislation called the Electricity Act 2003 (EA 2003)*. As per the EA 2003, the power to determine the tariff relating to generation, transmission and distribution of electricity is vested with the Electricity Regulatory Commissions. The tariff order devised by the Uttaranchal Electricity Regulatory Commission for hydro power projects in the state applicable at the time of investment decision was UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations dated 14 <sup>th</sup> May 2004 [IRL #56] (stipulated to remain in force
Auxiliary Consumption	0.5%	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 [IRL #56]	
Transformation Losses	0.5%	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 [IRL #56]	
O & M Charges and its escalation	1.5 % of Project Cost with an escalation of 4% per annum. The O&M Costs are re-set	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 [IRL #56]	

\* <http://www.cercind.gov.in/08022007/Act-with-amendment.pdf>

	on every fifth anniversary to the average O&M Costs over the last 5 years with an escalation of 4% per annum.		for a period of 5 years from the date of notification unless reviewed earlier or extended by the Commission). While determining tariff, multiple assumptions with respect to the incurrence of the operational and implementation cost for the project activity are made by the state electricity regulatory commission. The guidance of the same has been used by the DPR to compute the tariff and hence has been considered as appropriate and applicable at the time of decision making.
Return on Equity	14%	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 [IRL #56]	
Working Capital Computation - Maintenance & spares - O & M Expenses - Receivables	Maintenance & spares – 1% with an escalation on spares at 6% per annum.	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 [IRL #56]	
Debt Equity Ratio	70:30	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 [IRL #56],  CERC (Terms & Conditions of Tariff) Guidelines, 2004;  IREDA Financing Norms ( <a href="http://www.ireda.in/pdf/Financing%20Norms.pdf">http://www.ireda.in/pdf/Financing%20Norms.pdf</a> ).	
Energy Generation	170.9 Million KWh	Detailed Project Report  DPR provides energy generation in 50%, 75% and 90% dependable year out of which 50% dependable year was selected as most conservative. [IRL #59]. Further, generation potential is based on the following available hydrological data:  – 10 daily discharges at Bhilangana river at Tehri for 26 years	The DPR had been finalized only in January 2006 (Ref: Letter of submission of DPR to the state government dated 30/01/2006). Thus the values are applicable at the time of investment decision.  Further, as per “Guidelines for the reporting and validation of plant load factors” (EB 48, Annex 11), since the plant load factors have been taken from the DPR that was prepared by a third party engineering consultancy ‘TCE Consulting Engineers Ltd’ which was also approved by the Department of Energy, Govt. of Uttaranchal for

		<p>(1975-76 to 2000-01).</p> <ul style="list-style-type: none"> <li>– 10 daily discharges at the downstream Bhilangana I site for 6 years [1990-91, 1991-92, 1994-95, 2002-03, 2003-04 and 2004-05 (part)].</li> <li>– Concurrent discharges at Bhilangana I and Bhilangana III sites from end December 2003 to March 2005.</li> <li>– Yearly flood data of Bhilangana River at Tehri from 1978 to 1994.</li> </ul>	implementation, it is considered appropriate.
<p>Project Cost</p> <ul style="list-style-type: none"> <li>- Civil Works</li> <li>- Hydro Mechanical Works</li> <li>- Electro Mechanical Works</li> <li>- Transmission Line Works</li> </ul>	<p>INR 1895.798 Million</p>	<p>The contracts for Ex works Supply of Plant &amp; Equipment (with M/s Voith Siemens Hydro Pvt. Ltd. dated 15/05/2007 and 10/07/2007) and Civil works (M/s Srinivasa Constructions Limited dated 19/03/2007) have been cross checked to check the appropriateness of values used in the DPR [IRL #59] with actual costs incurred. Further, expense certificate duly audited by the Chartered Accountants (CA Certificate dated 18/11/2009 [IRL #60]) have been cross verified to determine the actual cost incurred till 30/09/2009.</p>	<p>It has been observed that the actual costs incurred on the major components such as land, civil works, hydro mechanical works etc. by the project proponent are much higher than the costs assumed in the DPR. Since, the project proponent had not entered into a firm contract at the time of decision making. The values used in the DPR are considered more appropriate. Also since the costs in DPR are lower, the values used in the IRR are conservative.</p>
<p>Interest on term Loan</p>	<p>9.50%</p>	<p>RBI Prime Lending Rate (PLR) for February was in the range of 10.25-10.75 (<a href="http://rbidocs.rbi.org.in/rdocs/">http://rbidocs.rbi.org.in/rdocs/</a>)</p>	<p>The average PLR of RBI at the time of investment decision was 10.5%. However, PP has used the value of 9.50% interest on term loan which is more conservative and further is also lesser than the</p>



		<a href="#">Wss/PDFs/69504.pdf</a> ). Actual loan Sanction letters from the financial institutions funding the project with the interest on loan @ 9.75%.	actual interest rate agreed with the lenders involved in the funding of the proposed project activity. (Guidelines on the assessment of Investment Analysis, Annex 58, Para 11, EB 51).
Tax Rates	MAT – 8.415% Corporate Tax – 33.66% Fringe Benefit Tax – 33.66%	Income Tax Act of 1961 The Fringe Benefit Tax, Minimum Alternate Tax, Corporate Tax Rates and tax incentives under Section 80 IC have been cross checked with the IT Act.	The IT act has been applicable since 1961. The DPR has followed the Income Tax rules applicable during the financial year 2005-2006* which were also applicable during the investment decision.

In accordance with the “Guidance on the assessment of Investment Analysis”, Version 03, in the calculation of Project IRR, the DOE would like to confirm that the Depreciation and other financing expenditures have been excluded from the cash flow used. Further, the DOE has carried out a comprehensive check on the correctness of Benchmark and IRR computations and would like to confirm that all calculations are correct and in line with the state and national regulations and also with the “Guidance on the assessment of Investment Analysis”, Version 03. The final Project IRR of 10.49% is lower than the WACC benchmark of 13.18%.

### Sensitivity Analysis

The project proponent has conducted a sensitivity analysis by varying the critical assumptions which constitute more than 20% of the total project cost or total project revenues such as - Energy Generation, Tariff, Operation and Maintenance Expenses and Capital Cost (Guidance on the assessment of Investment Analysis, Version 03, Para 17) to a reasonable variation of  $\pm 10\%$  (Guidance on the assessment of Investment Analysis, Version 03, Para 18). The results of the analysis are summarized below:

Parameters	-10%	10%	Remarks
Base Scenario	10.49%		
Energy Generation	9.87%	11.10%	Below the Benchmark
Tariff	8.67%	12.28%	Below the Benchmark
Capital Cost	10.72%	10.30%	Below the Benchmark
O&M Cost	10.48%	10.49%	Below the Benchmark

The analysis of the sensitivity analysis is as follows:

**1. Energy Generation** – As provided in the response of the project proponent, the expected average annual output using generation estimates @ 50% dependable year has been considered for the IRR estimation which is conservative in comparison to generation @ 90% or 75% dependable year [IRL #58]. It is worthwhile to mention that the reputed third party engineering consultancy TCE Consulting Engineers Ltd. have estimated the generation potential based on the following available hydrological data:

\* <http://law.incometaxindia.gov.in/TaxmannDit/DisplayPage/dpage2.aspx?md=24&typ=cn&yr=2006>

- 10 daily discharges at Bhilangana river at Tehri for 26 years (1975-76 to 2000-01).
- 10 daily discharges at the downstream Bhilangana I site for 6 years [1990-91, 1991-92, 1994-95, 2002-03, 2003-04 and 2004-05 (part)].
- Concurrent discharges at Bhilangana I and Bhilangana III sites from end December 2003 to March 2005.
- Yearly flood data of Bhilangana River at Tehri from 1978 to 1994.

Further since the project activity is a run of the river project dependent on the actual water availability and river flow, the increase in the average annual generation is less likely and hence an increase and decrease (which is more likely) in 10% annual generation has been considered to be appropriate.

**2. Tariff** – The tariff has been computed by the project proponent based on the cost plus approach stipulated by UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations [IRL #56]. These regulations were applicable for the determination of tariff for all hydro power projects under development in the state of Uttarakhand since its notification on 14/05/2004 (stipulated to remain in force for a period of 5 years from the date of notification unless reviewed earlier or extended by the Commission). This approach is in turn in accordance with the provisions of the Electricity Act, 2003 and the Central guidelines (CERC) as explained in the table above.

Since it has been calculated with the cost plus approach, the tariff will not vary during actual tariff determination. Thus, the sensitivity of increase in 10% tariff according to the guidance is acceptable.

**3. Capital Cost** – The DPR has assumed contingencies in the capital cost @ 7.5% in the IRR computation due to certain unforeseen events during project construction. The change in project cost at a similar rate would be appropriate and hence a variation in increase in capital cost by 10% over and above the 7.5 % already assumed in the DPR is considered acceptable. Further, the DOE has also verified the actual expenditure incurred for the major components of the project i.e. Land, Civil works, Hydro mechanical works etc. from the CA certificate [IRL #60] certifying the capital expenditure incurred till 30/09/2009 towards the setting up of the proposed project activity. Some of the changes in costs from the assumptions in the DPR are as follows:

Parameter	Cost assumed in the DPR	Actual Cost incurred till 30/09/2009	Difference
Land	23.8	41.3	17.5
Civil Works	556.3	770.9	214.6
Hydro Mechanical Works	28.3	130.1	101.8

(Costs - INR Million)

Based on the above, TUV SUD confirms that the actual capital cost will be higher from the assumed numbers and will not be less. Thus the actual capital costs would decrease the IRR and a scenario of decrease in capital costs from the assumed values is not anticipated.

**4. O & M cost** - The O&M costs are assumed as being 1.5 % of the project Cost with an escalation of 4% per annum in accordance with the UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004. The O&M Costs are re-set on every fifth year to the average O&M Costs over the last 5 years with an escalation of 4% per annum. These costs generally will not constitute 20% of either project cost or project revenues and hence a sensitivity analysis need not be conducted. However, since the project proponent has conducted a variation in these expenses @

±10%, which does not have a significant impact on the Project IRR, the sensitivity is considered acceptable.

The results of the sensitivity analysis above indicate that using normative variation in the critical assumptions expected during project construction/operation, the Project IRR still remains lesser than the WACC Benchmark value of 13.18%. The highest value of Project IRR is observed at a 10% variation in the tariff which as stated above is less likely.

Hence the DOE can confirm that the proposed CDM project activity would not be financially feasible without the revenues from CDM.

### 3.6.4 Common practice analysis

The region for the common practice analysis has been defined as Uttarakhand Province where the proposed project is located. The project activity's technology can be found in different country regions, where different situations can appear. Hence the region has been defined taken into account the kind of technology and the industry type. The assessment team has reviewed the approach presented in the PDD and can confirm that the relevant parameters as location, infrastructure, economical situation and development has been taken into account in order to define the region to be used for the common practice.

- The document "Hydro power Policy -2008", issued by the Ministry of Power (IRL 38)" substantiates that the presented region can be considered appropriate for the common practice analysis. [IRL#38]

Hence the presented region can be considered appropriate for the common practice analysis. The assessment team has reviewed official sources as Statistic of installed Hydro power plant by UJVNL, Government of Uttarakhand [IRL#41]. As per the information available on the small hydro power plants (plants with capacity less than 25 MW) in Uttarakhand (UJVNL website), majority of the 23 small hydro power plants operational in the state are less than 2 MW i.e. most of them fall in the classification of mini or micro hydro projects. Only 7 small hydro power plants are in operation with capacities between 2 and 25 MW. All of these seven projects have been implemented by Uttaranchal Jal Vidyut Nigam Limited (UJVNL). It should be noted that UJVNL is a wholly owned corporation of the Government of Uttarakhand (public sector) mandated for managing hydro power generation at existing power stations and development of new hydro projects with the purpose of harnessing hydro power resources of the state.

Being public sector projects, these projects have

- Easier access to funds and
- Lower expectations in terms of financial return.

Thus these projects cannot be compared to a private sector investment of the scale of the proposed Bhilangana III hydro project.

This information confirms that the list of similar projects presented in the PDD is complete. The selection of similar projects in the range of 2-25MW is deemed to be appropriate considering that the total capacity of the project activity is 24 MW. Additionally the team made a further cross check of the data source based on the interviews.

All the similar projects that are not a CDM project have been checked firstly by a review of all documentation available such as Hydro power policy, MNES annual report, List of SHPs, UJVNL etc. . The assessment team has also further cross-checked official sources as the lack of private players for range of capacities between 2 to 25 MW reinforces the unattractiveness of such projects for private players [IRL#38].

Hence it can be confirmed that the proposed CDM activity is not a common practice in the defined region.

### 3.7 Monitoring plan

The monitoring plan given in the PDD is as per the methodology ACM 0002 Version 07. It includes all the parameters to arrive at the ex-post estimation of the baseline emissions and there by emission reductions. The selected monitoring methodology is deemed to be the most applicable for this project. The application of the monitoring methodology is transparent. As the calculation of the baseline emissions is based on an ex-ante approach the monitoring will only involve metering the net electricity supplied to the grid. The PDD transparently describes the monitoring of the parameter.

As per methodology, the following parameters will be monitored:

- \_ Total Electricity generated by the project activity.
- \_ Electricity supplied to Northern grid.
- \_ Electricity imported from the Northern grid.
- \_ Installed capacity of the hydro power plant after the implementation of the project activity on annual basis.
- \_ Reservoir area measured in the surface of the water, after the implementation of the project activity, when the reservoir is full on annual basis.
- Diesel consumption at project site during the year.

The electricity supplied to the grid as well as the electricity imported from the grid is measured continuously and recorded monthly, as required by the methodology. A CDM team will be responsible for the collection of sales receipts of the electricity supplied to the grid and billing receipts of the power supplied from the grid to the project. Electronic data will be kept for 2 years after the end of the crediting period. For this case, one main and one check bidirectional meters will be installed with the required accuracy of minimum 0.2S. These meters will be installed at interconnection point. The meters will be calibrated annually by an accredited government/private agencies. The procedures for metering will be as per the provisions specified in the latest Indian Electricity Grid Code (IEGC) and/or Uttarakhand State Grid Code and/or Uttarakhand Electricity Regulatory Commission (UERC). The net electricity supplied to the grid (EGy) is calculated from the exported electricity to the grid and imported electricity to the project. Therefore, the appropriateness of the formula used to calculate EGy was evaluated by TÜV SÜD. In order to measure the total electricity produced (TEGy) by the project activity, including electricity supplied to the grid and the electricity supplied to internal loads and losses, 3 multifunction meters of 0.5 accuracy class will be installed at the generator panels". The meter calibration will be done once in every two years by an accredited government / private agency.

CO2 emission reductions due to the project activity are directly linked to the electricity supplied by the project to the Northern grid, and therefore the monitoring methodology will give opportunity for real measurements of achieved emission reductions.

Information on accuracy levels of measurement instruments is included in the revised PDD. Recording frequency and archiving methods are considered being reasonable and appropriate as well. As the monitoring parameter is a key parameter for invoicing of power supply, delivery of high quality data should be ensured.

No leakage is evident in the project activity as per ACM0002 Version 08.

The project's overall operational management structures have been clearly presented in the PDD. TÜV SÜD confirms that the monitoring plan described in the PDD is in compliance with the requirements in the applied methodology. Furthermore, TÜV SÜD considers the described monitoring procedures as feasible and is confident that the project participants are capable of implementing this plan [IRL # 43].

### **3.8 Sustainable development**

The project will lead to sustainable development through employment generation, generation of clean energy and reducing the electricity supply-demand gap. The project has received the host country approval letter which indicates that the project will contribute to the sustainable development in India.

### **3.9 Local stakeholder consultation**

Relevant stakeholders have been consulted for the project, dated 29.11.2007. Appropriate media, i.e., local newspaper has been used to invite the local stakeholders for a meeting. There were no adverse comments received for the project. The stated information in the PDD has been validated based on the submitted documents as follows:

1. Invitation for stakeholder consultation meeting in the local newspaper [IRL # 27]
2. List of the participants in the local stakeholder consultation meeting [IRL # 29]
3. Minutes of meeting of the stakeholder consultation meeting [IRL # 30]

As a result, TÜV SÜD considers the applied process for the local stakeholder consultation as adequate and appropriate.

### **3.10 Environmental impacts**

An environmental impact assessment (EIA) study has been carried out for the project as per the government regulations. There are no significant environmental impacts of the project. The same has been validated based on the EIA study submitted for the project. The project has received the environmental approval [IRL # 32].

## 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:

<b>webpage:</b> <a href="http://cdm.unfccc.int/Projects/Validation/DB/P2HKOBH8O9C5UU56QK84ZFRR1ULGFK/view.html">http://cdm.unfccc.int/Projects/Validation/DB/P2HKOBH8O9C5UU56QK84ZFRR1ULGFK/view.html</a>	
<b>Starting date of the global stakeholder consultation process:</b> 22-05-2008	
<b>Comment submitted by:</b> None	<b>Issues raised:</b> -
<b>Response by TÜV SÜD:</b> -	

## 5 VALIDATION OPINION

TÜV SÜD has performed a validation in accordance with the VVM, version 1, (EB44, Annex 3) of the following proposed CDM project activity:

### 24 MW Bhilangana - III Hydro Power Project

Standard auditing techniques have been used for the validation of the project. A Methodology-specific protocol customised for the project have been prepared to carry out the audit and present the outcome in a transparent and comprehensive manner.

The review of the project design documentation, the subsequent follow-up interviews and the further cross check of references have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria in the protocol. 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.

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 in a measurable and verifiable manner 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 following the VVM requirements. 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, 2010-02-22

Munich, 2010-002-22



Cuiyun Zhang

Deputy Head of Certification Body  
"Climate and Energy"



Sven Kolmetz

Assessment Team Leader

Validation of the CDM Project:  
24 MW Bhilangana - III Hydro Power Project



Industrie Service

## **Annex 1: Validation Protocol**



## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

**Table 1 Conformity of Project Activity and PDD**

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
<b>A. General description of project activity</b>					
<b>A.1. Title of the project activity</b>					
A.1.1.	Does the used project title clearly enable to identify the unique CDM activity?	1,2	Project title could be clearly identified as the project activity is 24 MW Bhilangana - III Hydro Power Project.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.1.2.	Are there any indication concerning the revision number and the date of the revision?	1,2	PDD submitted is version 01 and completion date is 4 <sup>th</sup> January, 2008 which is correctly mentioned in PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.1.3.	Is this consistent with the time line of the project's history?	1,2	Yes, consistent with the time line of the project history.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.2. Description of the project activity</b>					
A.2.1.	Is the description delivering a transparent overview of the project activities?	1,2	The proposed project activity is utilization of waters of Bhilangana River, a tributary of the river Bhagirathi, for setting up an environmentally benign project for generation of electricity. The project is implemented by Bhilangana Hydro Power Limited (BHPL) which is being promoted by Mr. Sanjiv Saraf and his associates.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.2.	What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	9,10,11,12,13,14,15,16,18,21	The following documents have been checked at site; <ul style="list-style-type: none"> <li>• Board resolution</li> <li>• Purchase agreement</li> <li>• Consent letter</li> <li>• PPA</li> </ul>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.3.	Is the information provided by these proofs consistent with the information provided by the PDD?	1,2,9,10,11,1	Yes, the information is consistent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
	2,13,14,15,16,18,21			
A.2.4. Is all information presented consistent with details provided by further chapters of the PDD?	1,2	Yes, the information within the PDD is consistent with the provided proof of documents.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.3. Project participants</b>				
A.3.1. Is the form required for the indication of project participants correctly applied?	1,2,4	Yes, the required form is correctly applied.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.3.2. Is the participation of the listed entities or Parties confirmed by each one of them?	34,37	Approval letter from the DNA and Modalities of communication has been submitted.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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)?	1,2,4	Yes, consistent within the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.4. Technical description of the project activity</b>				
<b>A.4.1. Location of the project activity</b>				
A.4.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1,2,5	Yes, location of the project activity is clearly mentioned in the PDD. The project activity is located on Ghansali-Ghuttu road a distance of about 170 km from Rishikesh via New Tehri Township.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.1.2. How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (ownership, li-	1,2,9,10,11,1	EIA, Consent to establish, Consent to operate, power purchase agreement and implementation agreement with supplier.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
censes, contracts etc.)?	2,13, 14,1 5,16, 18,2 1			
<b>A.4.2. Category(ies) of project activity</b>				
A.4.2.1. To which category(ies) does the project activity belong to? Is the category correctly identified and indicated?	1,2,3	The type is correctly identified and indicated in the PDD (chapter A.4.2). The project is Type I-renewable energy project.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.4.3. Technology to be employed by the project activity</b>				
A.4.3.1. Does the technical design of the project activity reflect current good practices?	1,2,9 ,10,1 1	The project uses proven Francis type turbines along with suitable generators. These turbines were found most suitable to utilize the available discharge in the river.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.2. Does the description of the technology to be applied provide sufficient and transparent input/ information to evaluate its impact on the greenhouse gas balance?	1,2	Because the project activity comprises the use of power for the substitution of grid supplied electricity mainly from coal fired plant, certainly, this technology will reduce GHG emissions significantly.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.3. Does the implementation of the project activity require any technology transfer from annex-I-countries to the host country(ies)?	1,2	No, technology will be supplied by India.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.4. Is the technology implemented by the project activity environmentally safe?	1,2	Being a project utilizing water resource for electricity generation, it is expected that will not create any environmental problem.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.5. Is the information provided in compliance with actual situation or planning?	1,2,5 ,18,9 ,10	The following documents have been checked to ensure the actual situation and planning; DPR,PPA,PA etc.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.6. Does the project use state of the art technology and / or does the technology result	1,2,9 ,10,1	See A.4.3.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
in a significantly better performance than any commonly used technologies in the host country?	1			
A.4.3.7. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2,	It is not expected that there will be a substitution because the turbines and the other equipment will be newly commissioned and installed.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.8. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1,2,9,10	The initial training requirements have been sufficiently supplied by the equipment supplier and in addition trained staff will be re-recruited to operate and maintain the plant.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.9. Is information available on the demand and requirements for training and maintenance?	1,2,9,10	See A.4.3.8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.10. Is a schedule available for the implementation of the project and are there any risks for delays?	1,2,8	The planning schedule in the past and for the future has been discussed during site-visit. <b><u>Corrective Action Request No.1.</u></b> The time schedule of the implementation of the project should be included in the PDD.	CAR	<input checked="" type="checkbox"/>
<b>A.4.4. Estimated amount of emission reductions over the chosen crediting period</b>				
A.4.4.1. Is the form required for the indication of projected emission reductions correctly applied?	1,2,3	Yes, the form is correctly applied. It includes the years in crediting period and estimated annual & total emission reduction. <b><u>Clarification Request No.1.</u></b> Clarify why emission reduction figure for the first year is less compared to rest of the crediting period.	CR	<input checked="" type="checkbox"/>
A.4.4.2. Are the figures provided consistent with other data presented in the PDD?	1,2	Yes, consistent within the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.4.5. Public funding of the project activity</b>				

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
A.4.5.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	5,36	There's no public funding from Annex I parties. However, <b><u>Clarification Request No.2.</u></b> Clarify what is the source of funding for the project activity.	CR	<input checked="" type="checkbox"/>
A.4.5.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	1,2,4	Yes, consistent within the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B. Application of a baseline and monitoring methodology</b>				
<b>B.1. Title and reference of the approved baseline and monitoring methodology</b>				
B.1.1. Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?	1,2,3,4	Yes, the PDD is applying baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version8. Reference has been given in PDD, Chapter B.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.1.2. Is the applied version the most recent one and / or is this version still applicable?	1,2,3,4	The 8 <sup>th</sup> version of ACM002 is the latest one at the time when commencing the validation process.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.1.3. Does the methodology refer to the following tools with its latest approved versions: <ul style="list-style-type: none"> <li>- Tool to calculate the emission factor for an electricity system</li> <li>- Tool for the demonstration and assessment of additionality</li> <li>- Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion</li> </ul>	1,2,3,4	Yes, the reference is clearly given in the PDD under section B.1.  and "Tool to calculate the emission factor for an electricity system", Version 01. However, <b><u>Corrective Action Request No.2.</u></b> In section B.5, additionality tool version 4 is used. The same is not correct. The most recent version i.e. version 5 must be used. Entire section of the PDD needs to be revised as per the latest version of the tool	CAR	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD										
B.2. Justification of the choice of the methodology and why it is applicable to the project activity														
B.2.1. Is the applied methodology considered the most appropriate one?	1,2,3,4	The project activity is Grid connected renewable power generation and comply with all applicability criteria. Under section B.2 of the PDD justification is well described.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
Fill in the required amount of sub checklists for applicability criteria as given by the methodology applied and comment at least every line answered with “No”														
B.2.2. Criterion 1: Type of electricity capacity addition by grid-connected renewable power generation  The following types are possible: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	1,2,3,4	<table><tr><th>Applicability checklist</th><th>Yes / No</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>Evidences provided in the PDD?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> The project activity is Grid connected hydro power (renewable energy) generation.	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Evidences provided in the PDD?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No													
Criterion discussed in the PDD?	Yes													
Compliance provable?	Yes													
Evidences provided in the PDD?	Yes													
Compliance verified?	Yes													
B.2.3. Criterion 2 (in the case of hydro plants): -The project activity is implemented in an existing reservoir, with no change in the volume of reservoir or  -The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity is greater than 4 W/m2 or	1,2,3,4	<table><tr><th>Applicability checklist</th><th>Yes / No</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>Evidences provided in the PDD?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>yes</td></tr></table> The project activity results in new run-of-river reservoir of area 1455.5 m² and the power density of the project is 16,489 W/m². The calculated value is thus significantly greater than the threshold value of 4 W/m2.	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Evidences provided in the PDD?	Yes	Compliance verified?	yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No													
Criterion discussed in the PDD?	Yes													
Compliance provable?	Yes													
Evidences provided in the PDD?	Yes													
Compliance verified?	yes													

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD										
-The project activity results in new reservoirs and the power density of the power plant is greater than 4 W/m2.															
B.2.4.	Criterion 3 (in the case of modification/retrofit in existing power plants):  5 years of historical data (or 3 years in the case of non hydro project activities) are available	1,2,3,4	<table><tr><th>Applicability checklist</th><th>Yes / No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Evidences provided in the PDD?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> <p>The project activity results in new run-of-river reservoir, hence not applicable.</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Evidences provided in the PDD?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No														
Criterion discussed in the PDD?	NA														
Compliance provable?	NA														
Evidences provided in the PDD?	NA														
Compliance verified?	NA														
B.2.5.	Criterion 4: Defined electricity grid boundaries	1,2,3,4	<table><tr><th>Applicability checklist</th><th>Yes / No</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>Evidences provided in the PDD?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>The project activity would be feeding the electricity into the Northern Regional Grid, managed by Northern Region Electricity Board (NREB).</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Evidences provided in the PDD?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No														
Criterion discussed in the PDD?	Yes														
Compliance provable?	Yes														
Evidences provided in the PDD?	Yes														
Compliance verified?	Yes														
B.2.6.	Criterion 5: Approved inclusion in other methodologies (if applied only)	1,2,3,4	<table><tr><th>Applicability checklist</th><th>Yes / No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Evidences provided in the PDD?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> <p>Among the methodologies, ACM0002 is the only one applied to this project activity. Thus, this section is not applicable.</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Evidences provided in the PDD?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No														
Criterion discussed in the PDD?	NA														
Compliance provable?	NA														
Evidences provided in the PDD?	NA														
Compliance verified?	NA														

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD										
B.2.7. Criterion 6: Exclusion of fuel switching activities	1,2,3,4	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Evidences provided in the PDD?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> <p>This is a greenfield project activity and involves only renewable energy, hence not applicable.</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Evidences provided in the PDD?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No													
Criterion discussed in the PDD?	NA													
Compliance provable?	NA													
Evidences provided in the PDD?	NA													
Compliance verified?	NA													
B.2.8. Criterion 7: Exclusion of biomass fired power plants	1,2,3,4	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Evidences provided in the PDD?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Evidences provided in the PDD?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No													
Criterion discussed in the PDD?	NA													
Compliance provable?	NA													
Evidences provided in the PDD?	NA													
Compliance verified?	NA													
B.2.9. Criterion 8: Exclusion of hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m2.	1,2,3,4	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Evidences provided in the PDD?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>The project activity is a hydro power project that results in new run-of-river reservoirs, with a power density of 16,489 W/m2 (greater than 4 W/m2).</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Evidences provided in the PDD?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No													
Criterion discussed in the PDD?	Yes													
Compliance provable?	Yes													
Evidences provided in the PDD?	Yes													
Compliance verified?	Yes													
B.3. Description of the sources and gases included in the project boundary														
Integrate the required amount of sub-checklists for sources and gases as given by the methodology applied and comment on at least every line answered with “No”														
B.3.1. Source: Fugitive Emissions from non-condensable	1,2,3,4	<table><tr><td>Boundary checklist</td><td>Yes / No</td></tr></table>	Boundary checklist	Yes / No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
Boundary checklist	Yes / No													



## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD
gases contained in geothermal steam (geothermal power plants only) Gas(es): CO <sub>2</sub> , CH <sub>4</sub> Type: Project Emissions		Source and gas(es) discussed by the PDD?	NA		
		Inclusion / exclusion justified?	NA		
		Explanation / Justification sufficient?	NA		
		Consistency with monitoring plan?	NA		
		Not applicable			
B.3.2. Source: Emissions from combustion of fossil fuels required to operate the geothermal power plant (geothermal power plants only) Gas(es): CO <sub>2</sub> Type: Project Emissions	1,2,3,4	Boundary checklist	Yes / No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Source and gas(es) discussed by the PDD?	NA		
		Inclusion / exclusion justified?	NA		
		Explanation / Justification sufficient?	NA		
		Consistency with monitoring plan?	NA		
		Not applicable.			
B.3.3. Source: Emissions from the reservoir (hydro power plants only) Gas(es): , CH <sub>4</sub> Type: Project Emissions	1,2,3,4	Boundary checklist	Yes / No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Source and gas(es) discussed by the PDD?	Yes		
		Inclusion / exclusion justified?	Yes		
		Explanation / Justification sufficient?	Yes		
		Consistency with monitoring plan?	Yes		
		The power density of the project activity is 16,489 W/m2 and hence the power density of the project is greater than 10 W/m2, therefore project emissions are not required to be estimated and are taken as zero.			
B.3.4. Source: Emissions from electricity generation in fossil fuel fired power plants that is displaced due to the project activity Gas(es): CO <sub>2</sub> Type: Baseline Emissions	1,2,3,4	Boundary checklist	Yes / No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Source and gas(es) discussed by the PDD?	Yes		
		Inclusion / exclusion justified?	Yes		
		Explanation / Justification sufficient?	Yes		
		Consistency with monitoring plan?	Yes		

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD										
B.3.5. Source: Emissions from electricity generation in fossil fuel fired power plants of any connected electricity system Gas(es): CO <sub>2</sub> Type: Baseline Emissions	1,2,3,4	<table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Source and gas(es) discussed by the PDD?</td><td>Yes</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Yes</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Yes</td></tr><tr><td>Consistency with monitoring plan?</td><td>Yes</td></tr></table>	Boundary checklist	Yes / No	Source and gas(es) discussed by the PDD?	Yes	Inclusion / exclusion justified?	Yes	Explanation / Justification sufficient?	Yes	Consistency with monitoring plan?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Boundary checklist	Yes / No													
Source and gas(es) discussed by the PDD?	Yes													
Inclusion / exclusion justified?	Yes													
Explanation / Justification sufficient?	Yes													
Consistency with monitoring plan?	Yes													
B.3.6. Source: Emissions from electricity generation in fossil fuel fired power plants of imported electricity (project electricity consumption) Gas(es): CO <sub>2</sub> Type: Baseline Emissions	1,2,3,4	<table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Source and gas(es) discussed by the PDD?</td><td>Yes</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Yes</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Yes</td></tr><tr><td>Consistency with monitoring plan?</td><td>Yes</td></tr></table>	Boundary checklist	Yes / No	Source and gas(es) discussed by the PDD?	Yes	Inclusion / exclusion justified?	Yes	Explanation / Justification sufficient?	Yes	Consistency with monitoring plan?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Boundary checklist	Yes / No													
Source and gas(es) discussed by the PDD?	Yes													
Inclusion / exclusion justified?	Yes													
Explanation / Justification sufficient?	Yes													
Consistency with monitoring plan?	Yes													
B.3.7. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by the PDD?	1,2,3,4	Yes, It has been verified at site and inline with the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario														
B.4.1. Is it clearly described that the baseline is represented by the combined margin of the grid the activity will be connected to?	1,2,3,4	It's clearly stated in the PDD that the baseline is: electricity delivered to the grid by the proposed project would have otherwise been generated by fossil-fuel-fired plants which are connected to the Northern Grid.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
B.4.2. In case of any modification or retrofit of existing facilities: Is data available to determine the historic production level?	1,2,3,4	There's no modification of an existing facility, so this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
B.4.3. In case of any modification or retrofit of existing facilities: Have conservative assumptions been applied in order to estimate the point in time when the existing equipment needs to be replaced?	1,2,3,4	See B.4.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Changes required for methodology implementation in 2 <sup>nd</sup> and 3 <sup>rd</sup> crediting periods				
B.4.4. Has the continued validity of the baseline been correctly assessed?	1,2,3,4	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.4.5. Has the baseline been updated with new data?	1,2,3,4	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>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 CDM project activity (assessment and demonstration of additionality):</b>				
B.5.1. Is evidence provided, that CDM has been considered seriously in the decision to proceed with the project activity (CDM decision before project start)?	1,2,3,4	<b><u>Corrective Action Request No.3.</u></b> As the start date of the project activity is before validation, provide the evidence to prove that incentive from the CDM was seriously considered to proceed with the project activity. The same also needs to be incorporated in the PDD.	CAR	<input checked="" type="checkbox"/>
B.5.2. Have realistic and credible alternatives been identified providing comparable outputs or services? (step 1a)	1,2,3,4	The following alternatives are discussed: 1. Project activity not undertaken as a CDM project 2. Continuation of the current situation in the northern grid with no project activity and equivalent amount of energy have been produced by the grid electricity system through its currently running power plants (which are mostly thermal) and or by new capacity addition to the grid.  <b><u>Clarification Request No.3.</u></b>	CR	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
			Why are you not discussing other renewable energy options, while discussing the baseline scenario?		
B.5.3.	Is the project activity without CDM included in these alternatives? (step 1a)	1,2,3,4	Yes, see above.	CR	<input checked="" type="checkbox"/>
B.5.4.	Is a discussion provided for all identified alternatives concerning the compliance with applicable laws and regulations? (step 1b)	1,2,3,4	The relative regulations and laws are discussed for each scenario in the PDD. However, <b><u>Clarification Request No.4.</u></b> Provide some valid documents/weblink to support the statement made therein.	CR	<input checked="" type="checkbox"/>
B.5.5.	In case the PDD argues that specific laws are not enforced in the country or region: Is evidence available concerning that statement? (step 1b)	1,2,3,4	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.6.	In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	1,2,3,4	Project activity is using step III (Barrier Analysis) to demonstrate additionality of the project, hence this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.7.	In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income?	1,2,3,4	See B.5.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.8.	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)?	1,2,3,4	See B.5.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.9.	In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit	1,2,3,4	See B.5.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
ratio, or (levelized) unit cost)?				
B.5.10. 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?	1,2,3,4	See B.5.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.11. In case of Option II or Option III: Is the analysis presented in a transparent manner including publicly available proofs for the utilized data?	1,2,3,4	See B.5.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.12. In case of applying step 3 (barrier analysis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?	1,2,3,4	Investment, Institutional and Technical barriers are identified that prevent the proposed project without CDM to occur.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.13. In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?	1,2,3,4	<p><b>Investment barrier:</b> According to the PDD a number of bank had been approached for funding of the project. Only one bank agreed to provide fund for this project i.e Axis Bank.</p> <p><b><u>Clarification Request No.5.</u></b></p> <p>Clarify for the same with valid documents.</p> <p><b>Institutional Barrier:</b> PDD states that project activity was the first project which awarded to an IPP.</p> <p><b><u>Clarification Request No.6.</u></b></p> <p>Clarification is sought for the same.</p>	CR	<input checked="" type="checkbox"/>
B.5.14. 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?	1,2,3,4	Barriers analyzed above don't prevent the baseline alternative (Provision of equivalent amount of annual power output by the grid where the proposed project is connected with) from implementation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
B.5.15. 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)?	1,2,3,4	<b>Clarification Request No.7.</b> Please provide the supporting documents for assessing the following; <ul style="list-style-type: none"> <li>Choice of range of the size of similar plants can be well justified</li> <li>Regional scale of the assessment is well justified</li> <li>If the list of projects under the assumed (and justifiable assumptions) is complete.</li> </ul>	CR	<input checked="" type="checkbox"/>
B.5.16. 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)?	1,2,3,4	<b>Clarification Request No.8.</b> It must be justified for each and every project in the list how it can be excluded from detailed investigation. The reason that 6 of the 7 listed projects are below 15MW is not a valid justification in this context. Also the exclusion of the 7th plant by referring to the canal type structure alone is not sufficient and should be substantiated by evidence. Please prepare and evaluate each of the listed projects according to additionality tool requirements.	CR	<input checked="" type="checkbox"/>
B.5.17. Is it appropriately explained how the approval of the project activity will help to overcome the economic and financial hurdles or other identified barriers?	1,2,3,4	Yes, it has been transparently described in the PDD. The project activity is faces investment barrier and to alleviate this barrier they need CDM revenue.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B.6. Emissions reductions</b>				
<b>B.6.1. Explanation of methodological choices</b>				
B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	1,2,3,4	The calculation of the emission reduction is applied according to the steps described in "Tool to calculate the emission factor for an electricity system", indicated in ACM0002: <ul style="list-style-type: none"> <li>- Calculation of the Operating Margin Emission Factor</li> <li>- Calculation of the Build Margin Emission Factor</li> <li>- Calculation of the Combined Margin Emission Factor</li> </ul>	CR	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		These steps are described in a transparent manner <b><u>Clarification Request No.9.</u></b> Please provide the excel spreadsheet utilized for the EF calculation.		
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?	1,2,3,4	Yes, the justification has been discussed and demonstrated in the PDD based on the options provided from the latest "Tool to calculate the emission factor for an electricity system"	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.3. Are the formulae required for the determination of project emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2,3,4	According to the methodology, project emissions need not to be considered.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.4. Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2,3,4	The formulae used are in compliance with the one in the defined methodology version 07.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.5. Is the choice of options to determine the emissions factor (OM, BM) justified in a suitable and transparent manner?	1,2,3,4	The justification is demonstrated in the PDD. Referring to the data from the Central Electricity Authority (CEA), the Simple OM to be the only approach for the OM calculation. The BM is calculated as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation and option of ex ante calculation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.6. Are the six steps as defined per the "Tool for calculation of emission factor for electrical systems" correctly applied by the project participants?	1,2,3,4	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.7. In case of alternative weighing factors for	1,2,3	The default weights of the 8 <sup>th</sup> version of ACM0002 (OM 0.5 and BM 0.5 respectively) are used.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
the Combined Margin: Is the quantification of the alternative weighing factor justified in a suitable and transparent manner?	,4			
B.6.1.8. In case of alternative weighing factors for the Combined Margin: Is the guidance for the PDD concerning the acceptability of alternative weights considered in the discussion?	1,2,3,4	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.9. Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2,3,4	No leakage is considered according to the methodology.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Tool to calculate project or leakage CO2 emissions from fossil fuel combustion				
B.6.1.10. Is the formula required for the determination of CO2 project emissions from fossil fuel combustion correctly presented, enabling a complete identification of parameter to be used and / or monitored	1,2,3,4	Since the BHPL project activity is a run-of-river hydro project that results in a new reservoir with power density of 16,489 W/m2, (greater than the threshold value of 10 W/m2), hence according to the chosen baseline methodology ACM0002 Version 08, project emissions are nil.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.11. Is option A (preferred approach) or option B chosen for the determination of the CO2 emission coefficient COEFi,y and is COEFi,y correctly determined?	1,2,3,4	See above	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.1.12. Are formulae required for the determination of emission reductions correctly presented?	1,2,3,4	Yes, it has been correctly applied.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B.6.2. Data and parameters that are available at validation</b>				

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD																			
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?	1,2,3,4	Yes. A list of parameters is clearly presented according to ACM0002.	☑	☑																			
B.6.2.2. Is the choice of ex-ante or ex-post vintage of OM and BM factors clearly specified in the PDD?	1,2,3,4	Yes, the ex-ante calculation of emission factors is chosen.	☑	☑																			
Fill in the required amount of sub checklists for monitoring parameter and comment any line answered with “No”																							
B.6.2.3. Parameter Title: GWP <sub>CH4</sub> Global warming potential of methane valid for the relevant commitment period (tCO2/tCH4)	1,2,3,4	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>		Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	☑	☑
		Data Checklist	Yes / No																				
		Title in line with methodology?	NA																				
		Data unit correctly expressed?	NA																				
		Appropriate description of parameter?	NA																				
		Source clearly referenced?	NA																				
		Correct value provided?	NA																				
		Has this value been verified?	NA																				
		Choice of data correctly justified?	NA																				
		Measurement method correctly described?	NA																				
Not applicable																							

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD																		
B.6.2.4. Parameter Title: EG <sub>historical</sub> (only applicable to modification/retrofit of an existing grid-connected renewable power plant/unit)  Average of historical electricity delivered by the existing facility to the grid (MWh)	1,2,3,4	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table> Project activity is the new installation, hence not applicable.	Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																					
Title in line with methodology?	NA																					
Data unit correctly expressed?	NA																					
Appropriate description?	NA																					
Source clearly referenced?	NA																					
Correct value provided?	NA																					
Has this value been verified?	NA																					
Choice of data correctly justified?	NA																					
Measurement method correctly described?	NA																					
B.6.2.5. Parameter Title: DATE <sub>BaselineRetrofit</sub> (only applicable to modification/retrofit of an existing grid-connected renewable power plant/unit)  Point in time when the existing equipment would need to be replaced in the absence of the project activity	1,2,3,4	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table> Project activity is the new installation, hence not applicable	Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																					
Title in line with methodology?	NA																					
Data unit correctly expressed?	NA																					
Appropriate description?	NA																					
Source clearly referenced?	NA																					
Correct value provided?	NA																					
Has this value been verified?	NA																					
Choice of data correctly justified?	NA																					
Measurement method correctly described?	NA																					
B.6.2.6. Parameter Title: EF <sub>Res</sub> (only applicable to hydro-power plants with reservoir)  Default emission factor for emissions from reservoirs (kgCO2e/MWh)	1,2,3,4	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Data Checklist	Yes / No																					
Title in line with methodology?	NA																					
Data unit correctly expressed?	NA																					
Appropriate description of parameter?	NA																					
Source clearly referenced?	NA																					
Correct value provided?	NA																					
Has this value been verified?	NA																					

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD																		
		Choice of data correctly justified?	NA																				
		Measurement method correctly described?	NA																				
B.6.2.7. Parameter Title: CAP <sub>BL</sub> (W) (only applicable to modification/retrofit of an existing grid-connected renewable power plant/unit)  Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero.	1,2,3,4	<table><tr><td>Data Checklist</td><td>Yes / No</td></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>		Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	☑	☑
Data Checklist	Yes / No																						
Title in line with methodology?	NA																						
Data unit correctly expressed?	NA																						
Appropriate description of parameter?	NA																						
Source clearly referenced?	NA																						
Correct value provided?	NA																						
Has this value been verified?	NA																						
Choice of data correctly justified?	NA																						
Measurement method correctly described?	NA																						
B.6.2.8. Parameter Title: A <sub>BL</sub> (only applicable to hydropower plant projects with reservoir)  Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m2). For new reservoirs, this value is zero (m <sup>2</sup> ).	1,2,3,4	<table><tr><td>Data Checklist</td><td>Yes / No</td></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>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table> As mentioned in the chosen methodology ACM0002 version 8, for new reservoir value is taken to be zero.		Data 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?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	☑	☑
Data 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?	Yes																						
Has this value been verified?	Yes																						
Choice of data correctly justified?	Yes																						
Measurement method correctly described?	Yes																						
B.6.2.9. Parameter Title: Emission factor of the grid (EF <sub>CM</sub> in tCO <sub>2</sub> /MWh)	1,2,3,4	<table><tr><td>Data Checklist</td><td>Yes / No</td></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></table>		Data Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	☑	☑										
Data Checklist	Yes / No																						
Title in line with methodology?	Yes																						
Data unit correctly expressed?	Yes																						
Appropriate description of parameter?	Yes																						

# Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		
		CEA data has been used.			
B.6.2.10. Parameter Title: Operating margin (EF <sub>OM</sub> in tCO <sub>2</sub> /MWh) emission factor of the grid	1,2,3 ,4	Data Checklist	Yes / No	☑	☑
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		
		CEA data has been used.			
B.6.2.11. Parameter Title: Build margin (EF <sub>BM</sub> intCO <sub>2</sub> /MWh) emission factor of the grid	1,2,3 ,4	Data 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?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		
		CEA data has been used.			

# Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD																		
B.6.2.12. Parameter Title: $FC_{i,m,y}$ , $FC_{i,y}$ , $FC_{i,j,y}$ , $FC_{i,k,y}$ , $FC_{i,n,y}$ and $FC_{i,n,h}$ Amount of fossil fuel type i consumed by power plant / unit m,j,k or n (or in the project electricity system in case of $FC_{i,y}$ ) in year y or hour h (mass or volume unit)	1,2,3,4	<table><tr><th>Data 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?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>	Data 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?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data 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?	Yes																					
Has this value been verified?	Yes																					
Choice of data correctly justified?	Yes																					
Measurement method correctly described?	Yes																					
B.6.2.13. Parameter Title: $NCV_{i,y}$ Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)	1,2,3,4	<table><tr><th>Data 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?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table> Not applicable.	Data 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?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data 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?	Yes																					
Has this value been verified?	Yes																					
Choice of data correctly justified?	Yes																					
Measurement method correctly described?	Yes																					
B.6.2.14. Parameter Title: $EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$ CO2 emission factor of fossil fuel type i in year y (tCO2/GJ)	1,2,3,4	<table><tr><th>Data 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></table>	Data Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
Data Checklist	Yes / No																					
Title in line with methodology?	Yes																					
Data unit correctly expressed?	Yes																					
Appropriate description of parameter?	Yes																					

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		
B.6.2.15. Parameter Title: EG <sub>m,y</sub> , EG <sub>y</sub> , EG <sub>j,y</sub> , EG <sub>k,y</sub> and EG <sub>n,h</sub> Net electricity generated and delivered to the grid by power plant / unit m,j,k or n (or in the project electricity system in case of EG <sub>y</sub> ) in year y or hour h (MWh)	1,2,3,4	Data 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?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		
B.6.2.16. Parameter Title: EG <sub>PJ,h</sub> Electricity displaced by the project activity in hour h of year y (in MWh)  (only applicabe for the dispatch data OM)	1,2,3,4	Data Checklist	Yes / No	☑	☑
		Title in line with methodology?	NA		
		Data unit correctly expressed?	NA		
		Appropriate description of parameter?	NA		
		Source clearly referenced?	NA		
		Correct value provided?	NA		
		Has this value been verified?	NA		
		Choice of data correctly justified?	NA		
		Measurement method correctly described?	NA		



## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD																		
B.6.2.17. Parameter Title: $\eta_{m,y}$ Average net energy conversion efficiency of power unit m in year y	1,2,3,4	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>		Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																						
Title in line with methodology?	NA																						
Data unit correctly expressed?	NA																						
Appropriate description of parameter?	NA																						
Source clearly referenced?	NA																						
Correct value provided?	NA																						
Has this value been verified?	NA																						
Choice of data correctly justified?	NA																						
Measurement method correctly described?	NA																						
B.6.2.18. Parameter Title: fraction of time with low costs /must run plant at the margin (for simple adjusted OM only)	1,2,3,4	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table> <p>Simple OM method is opted.</p>		Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																						
Title in line with methodology?	NA																						
Data unit correctly expressed?	NA																						
Appropriate description of parameter?	NA																						
Source clearly referenced?	NA																						
Correct value provided?	NA																						
Has this value been verified?	NA																						
Choice of data correctly justified?	NA																						
Measurement method correctly described?	NA																						
B.6.3. Ex-ante calculation of emission reductions																							
B.6.3.1. Is the projection based on the same procedures as used for future monitoring?	1,2,3,4	Yes, the emission reduction is determined by deducting the project emission and leakage from baseline emission. The same is adopted for the future monitoring.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																		
B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?	1,2,3,4	Yes, it is documented in complete and transparent manner.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																		
B.6.3.3. Is the calculation of the operating margin	1,2,3	Yes		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																		

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
and build margin emission factors documented electronically in a spreadsheet with the relevant information as defined per the "Tool for calculation of emission factor for electrical systems"? Has this spreadsheet been submitted to the validation team?	,4			
B.6.3.4. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	1,2,3 ,4	Yes, consistent within the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B.6.4. Summary of the ex-ante estimation of emission reductions</b>				
B.6.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1,2,3 ,4	Yes, the project will result in fewer GHG emissions than the baseline scenario.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1,2,3 ,4	Yes, required form is correctly applied.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1,2,3 ,4	Yes, the life time of the project is expected to be 40 years and fixed crediting period has been taken. Therefore, the yearly emission reduction and total emission reduction indicated in table under section B.6.4 is inline.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.4. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	1,2,3 ,4	Yes, consistent within the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B.7. Application of the monitoring methodology and description of the monitoring plan</b>				
<b>B.7.1. Data and parameters monitored</b>				
B.7.1.1. Is the list of parameters presented by	1,2,3	Yes. The EGy is the parameter that shall be monitored and recorded.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD																								
chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?	,4																											
Integrate the required amount of sub-checklists for monitoring parameter and comment on any line answered with “No”																												
B.7.1.2. Parameter Title: EGy Electricity supplied by the project activity to the grid (in MWh)	1,2,3 ,4	<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>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr><tr><td>Correct reference to standards?</td><td>Yes</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>Yes</td></tr></table>	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?	Yes	Has this value been verified?	Yes	Measurement method correctly described?	Yes	Correct reference to standards?	Yes	Indication of accuracy provided?	Yes	QA/QC procedures described?	Yes	QA/QC procedures appropriate?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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?	Yes																											
Has this value been verified?	Yes																											
Measurement method correctly described?	Yes																											
Correct reference to standards?	Yes																											
Indication of accuracy provided?	Yes																											
QA/QC procedures described?	Yes																											
QA/QC procedures appropriate?	Yes																											
B.7.1.3. Parameter Title: TEGy Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (in MWh).	1,2,3 ,4	<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>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr><tr><td>Correct reference to standards?</td><td>Yes</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr></table>	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?	Yes	Has this value been verified?	Yes	Measurement method correctly described?	Yes	Correct reference to standards?	Yes	Indication of accuracy provided?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
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?	Yes																											
Has this value been verified?	Yes																											
Measurement method correctly described?	Yes																											
Correct reference to standards?	Yes																											
Indication of accuracy provided?	Yes																											

# Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD
		QA/QC procedures described?	Yes		
		QA/QC procedures appropriate?	Yes		
B.7.1.4. Parameter Title: EF <sub>grid,CM,y</sub>  Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO2/MWh)	1,2,3,4	<b>Not applicable, as this protocol refers to the ex-ante determination of CM.</b>		☑	☑
		Monitoring Checklist	Yes / No		
		Title in line with methodology?	NA		
		Data unit correctly expressed?	NA		
		Appropriate description of parameter?	NA		
		Source clearly referenced?	NA		
		Correct value provided for estimation?	NA		
		Has this value been verified?	NA		
		Measurement method correctly described?	NA		
		Correct reference to standards?	NA		
		Indication of accuracy provided?	NA		
		QA/QC procedures described?	NA		
		QA/QC procedures appropriate?	NA		
B.7.1.5. Parameter Title: PEFC <sub>j,y</sub>  CO2 emissions from fossil fuel combustion in process j during the year y (tCO2/yr). Calculated as per the latest version of the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”	1,2,3,4	Not applicable		☑	☑
		Monitoring Checklist	Yes / No		
		Title in line with methodology?	NA		
		Data unit correctly expressed?	NA		
		Appropriate description of parameter?	NA		
		Source clearly referenced?	NA		
		Correct value provided for estimation?	NA		
		Has this value been verified?	NA		
		Measurement method correctly described?	NA		
		Correct reference to standards?	NA		
		Indication of accuracy provided?	NA		
		QA/QC procedures described?	NA		

# Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS			PDD in GSP	Final PDD																								
		QA/QC procedures appropriate?	NA																											
B.7.1.6. Parameter Title: Cap <sub>PJ</sub> (only applicable to hydropower plant projects)  Installed capacity of the hydro power plant after the implementation of the project activity (W).	1,2,3,4	<table><tr><td>Monitoring Checklist</td><td>Yes / No</td></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>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr><tr><td>Correct reference to standards?</td><td>Yes</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>Yes</td></tr></table>			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?	Yes	Has this value been verified?	Yes	Measurement method correctly described?	Yes	Correct reference to standards?	Yes	Indication of accuracy provided?	Yes	QA/QC procedures described?	Yes	QA/QC procedures appropriate?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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?	Yes																													
Has this value been verified?	Yes																													
Measurement method correctly described?	Yes																													
Correct reference to standards?	Yes																													
Indication of accuracy provided?	Yes																													
QA/QC procedures described?	Yes																													
QA/QC procedures appropriate?	Yes																													
B.7.1.7. Parameter Title: A <sub>PJ</sub> (only applicable to hydropower plant projects with reservoir)  Area of the reservoir measured in the surface of the water, after the implemenation of the project activity, when the reservoir is full (m <sup>2</sup> ).	1,2,3,4	<table><tr><td>Monitoring Checklist</td><td>Yes / No</td></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</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>NA</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>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table> The plant is run-of-river, hence not applicable.			Monitoring Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided for estimation?	NA	Has this value been verified?	NA	Measurement method correctly described?	NA	Correct reference to standards?	NA	Indication of accuracy provided?	NA	QA/QC procedures described?	NA	QA/QC procedures appropriate?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Checklist	Yes / No																													
Title in line with methodology?	NA																													
Data unit correctly expressed?	NA																													
Appropriate description of parameter?	NA																													
Source clearly referenced?	NA																													
Correct value provided for estimation?	NA																													
Has this value been verified?	NA																													
Measurement method correctly described?	NA																													
Correct reference to standards?	NA																													
Indication of accuracy provided?	NA																													
QA/QC procedures described?	NA																													
QA/QC procedures appropriate?	NA																													
B.7.1.8. Parameter Title: w <sub>Main,CO2</sub> Average mass fraction of CO <sub>2</sub> in steam	1,2,3,4	<table><tr><td>Monitoring Checklist</td><td>Yes / No</td></tr></table>			Monitoring Checklist	Yes / No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																						
Monitoring Checklist	Yes / No																													

# Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD																									
tCO2/t steam (for geothermal projects only)		<table><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</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>NA</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>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table>		Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided for estimation?	NA	Has this value been verified?	NA	Measurement method correctly described?	NA	Correct reference to standards?	NA	Indication of accuracy provided?	NA	QA/QC procedures described?	NA	QA/QC procedures appropriate?	NA					
Title in line with methodology?	NA																													
Data unit correctly expressed?	NA																													
Appropriate description of parameter?	NA																													
Source clearly referenced?	NA																													
Correct value provided for estimation?	NA																													
Has this value been verified?	NA																													
Measurement method correctly described?	NA																													
Correct reference to standards?	NA																													
Indication of accuracy provided?	NA																													
QA/QC procedures described?	NA																													
QA/QC procedures appropriate?	NA																													
		Not applicable																												
B.7.1.9. Parameter Title: w <sub>Main,CH4</sub> Average mass fraction of CH <sub>4</sub> in the produced steam (tCH4/t steam). for geothermal projects only)	1,2,3,4	<table><tr><td>Monitoring Checklist</td><td>Yes / No</td></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</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>NA</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>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table>		Monitoring Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided for estimation?	NA	Has this value been verified?	NA	Measurement method correctly described?	NA	Correct reference to standards?	NA	Indication of accuracy provided?	NA	QA/QC procedures described?	NA	QA/QC procedures appropriate?	NA		☑	☑
Monitoring Checklist	Yes / No																													
Title in line with methodology?	NA																													
Data unit correctly expressed?	NA																													
Appropriate description of parameter?	NA																													
Source clearly referenced?	NA																													
Correct value provided for estimation?	NA																													
Has this value been verified?	NA																													
Measurement method correctly described?	NA																													
Correct reference to standards?	NA																													
Indication of accuracy provided?	NA																													
QA/QC procedures described?	NA																													
QA/QC procedures appropriate?	NA																													
		Not applicable																												
B.7.1.10. Parameter Title: M <sub>S,y</sub> Quantity of steam produced during the	1,2,3,4	<table><tr><td>Monitoring Checklist</td><td>Yes / No</td></tr></table>		Monitoring Checklist	Yes / No		☑	☑																						
Monitoring Checklist	Yes / No																													

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD	
year y. (for geothermal projects only)		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			
		Appropriate description of parameter?	NA			
		Source clearly referenced?	NA			
		Correct value provided for estimation?	NA			
		Has this value been verified?	NA			
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
		Not applicable				
Parameters related to the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”						
B.7.1.11. Parameter Title:  Quantity of fuel type i combusted in process j during the year y  FCi,j,y	1,2,3 ,4	Monitoring Checklist	Yes / No		☑	☑
		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			
		Appropriate description of parameter?	NA			
		Source clearly referenced?	NA			
		Correct value provided for estimation?	NA			
		Has this value been verified?	NA			
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
B.7.1.12. Parameter title:  Weighted average mass fraction of carbon in fuel type i in year y	1,2,3 ,4	Monitoring Checklist	Yes / No		☑	☑
		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			



## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS		PDD in GSP	Final PDD
$W_{C,i,y}$		Appropriate description of parameter?	NA		
		Source clearly referenced?	NA		
		Correct value provided for estimation?	NA		
		Has this value been verified?	NA		
		Measurement method correctly described?	NA		
		Correct reference to standards?	NA		
		Indication of accuracy provided?	NA		
		QA/QC procedures described?	NA		
		QA/QC procedures appropriate?	NA		
B.7.1.13. Parameter title: Weighted average density of fuel type i in year y  $\rho_{i,y}$	1,2,3,4			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Checklist		Yes / No			
Title in line with methodology?		NA			
Data unit correctly expressed?		NA			
Appropriate description of parameter?		NA			
Source clearly referenced?		NA			
Correct value provided for estimation?		NA			
Has this value been verified?		NA			
Measurement method correctly described?		NA			
Correct reference to standards?		NA			
Indication of accuracy provided?		NA			
QA/QC procedures described?		NA			
QA/QC procedures appropriate?	NA				
B.7.1.14. Parameter title: Weighted average net calorific value of fuel type i in year y  $NCV_{i,y}$	1,2,3,4			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Checklist		Yes / No			
Title in line with methodology?		NA			
Data unit correctly expressed?		NA			
Appropriate description of parameter?		NA			
Source clearly referenced?		NA			
Correct value provided for estimation?		NA			
Has this value been verified?		NA			

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS			PDD in GSP	Final PDD
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
B.7.1.15. Parameter title: Weighted average CO2 emission factor of fuel type i in year y  EF <sub>CO2,i,y</sub>	1,2,3 ,4	Monitoring Checklist	Yes / No		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			
		Appropriate description of parameter?	NA			
		Source clearly referenced?	NA			
		Correct value provided for estimation?	NA			
		Has this value been verified?	NA			
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
<b>B.7.2. Description of the monitoring plan</b>						
B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situation?	1,2,3 ,4	<b>Corrective Action Request No.4.</b> A documented procedure defining roles and responsibilities for ensuring accurate data monitoring, collection, transfer and reporting needs to be developed. The procedure should also have the process of calibration of measuring equipments, data adjustments, internal audits & emergency preparedness leading to data losses.			CAR	<input checked="" type="checkbox"/>
B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	1,2,3 ,4	See B.7.2.1			CAR	<input checked="" type="checkbox"/>
B.7.2.3. Does the monitoring plan provide current	1,2,3	See B.7.2.1			CAR	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
good monitoring practice?	,4			
B.7.2.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	1,2,3,4	See B.7.2.1	CAR	<input checked="" type="checkbox"/>
<b>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>				
B.8.1. Is there any indication of a date when the baseline was determined?	1,2,3	The baseline is determined on 4 <sup>th</sup> January 2008.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.2. Is this consistent with the time line of the PDD history?	1,2,3	<b><u>Clarification Request No.10.</u></b> Under section A.1 the PDD completion date is mentioned 4 <sup>th</sup> Jan, 2008 and the baseline completion date is also 4 <sup>th</sup> Jan, 2008. Clarify for the same.	CR	<input checked="" type="checkbox"/>
B.8.3. 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?	1,2,	Yes. The responsible person is the project participant.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.4. Is information provided whether this person / entity is also considered a project participant?	1,2	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>C. Duration of the project activity / crediting period</b>				
<b>C.1. Duration of the project activity</b>				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reason-	1,2,3	<b><u>Corrective Action Request No.5.</u></b>	CAR	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
able?		,4	Justification of project starting date needs to be included in C.1 of PDD.		
<b>C.2. Choice of the crediting period and related information</b>					
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)?	1,2,3 ,4	Fixed crediting period has been chosen.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>D. Environmental impacts</b>					
<b>D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts</b>					
D.1.1.	Has the analysis of the environmental impacts of the project activity been sufficiently described?	1,2,3 ,4,32	Yes, the environmental impacts of the project activity during construction and operation period have been clearly described.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.2.	Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved?	1,2,3 ,4,32	EIA study has been done and submitted the same to DOE.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.3.	Will the project create any adverse environmental effects?	1,2,3 ,4,32	See D.1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.4.	Were transboundary environmental impacts identified in the analysis?	1,2,3 ,4,32	See D.1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
<b>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</b>					
D.2.1.	Have the identified environmental impacts been addressed in the project design sufficiently?	1,2,3	See D.1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.2.2.	Does the project comply with environmental legislation in the host country?	1,2,3	See D.1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>E. Stakeholders' comments</b>					
<b>E.1. Brief description how comments by local stakeholders have been invited and compiled</b>					
E.1.1.	Have relevant stakeholders been consulted?	1,2,2 7,28, 29,3 0,31	Yes, the relevant stakeholders have been consulted. The key stakeholders were; <ul style="list-style-type: none"> <li>Local people and their representatives</li> <li>Ministry of Environment and Forests (MoEF), Government of India</li> <li>Government of Uttarakhand (GoU)</li> <li>Uttaranchal Jal Vidyut Nigam Limited (UJVNL)</li> <li>Various State Departments such as Labour, Irrigation, PWD, Forest, Drinking Water and Fisheries.</li> <li>Uttaranchal Environment Protection and Pollution Control Board (UEPPCB)</li> </ul>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.2.	Have appropriate media been used to invite comments by local stakeholders?	1,2,2 7,28, 29,3 0,31	The project owner made employees visit and introduced the project to the stakeholders; via an invitation of stakeholder meeting was send out to the local residents. A brochure in the local language was also circulated to the stakeholders before the meeting, describing the salient features as well as the social, economic and environmental	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		impacts of the project.		
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 regulations/laws?	1,2,2 7,28, 29,3 0,31	There are no regulations/laws in India for carrying out the stakeholder consultation process for this project activity.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	1,2,2 7,28, 29,3 0,31	See E.1.1		<input checked="" type="checkbox"/>
<b>E.2. Summary of the comments received</b>				
E.2.1. Is a summary of the stakeholder comments received provided?	1,2,2 7,28, 29,3 0,31	Yes, It has been received.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>E.3. Report on how due account was taken of any comments received</b>				
E.3.1. Has due account been taken of any stakeholder comments received?	1,2,2 7,28, 29,3 0,31	Yes, Due account has been taken for all the comments received by the various stakeholders.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>F. Annexes 1 - 4</b>				
<b>Annex 1: Contact Information</b>				
F.1.1. Is the information provided consistent with the one given under section A.3?	1,2,	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
F.1.2. Is the information on all private participants and directly involved Parties presented?	1,2	Yes, all information has been presented.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Annex 2: Information regarding public funding</b>				
F.1.3. Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	1,2,3 6	See A.4.5.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.4. If necessary: Is an affirmation available that any such funding from Annex-I-countries does not result in a diversion of ODA?	1,2,3 6	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Annex 3: Baseline information</b>				
F.1.5. If additional background information on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?	1,2,3 ,4	All the data source and applied formulae are completely demonstrated in Chapter B of the PDD and addition to that additional background information is also provided in Annex 3.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.6. Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	1,2,3 ,4	Yes, CEA data has been used to calculate emission factor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.7. Does the additional information substantiate / support statements given in other sections of the PDD?	1,2,3 ,4	See F.1.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Annex 4: Monitoring information</b>				
F.1.8. If additional background information on monitoring is provided: Is this information	1,2,3	Because the management framework and data control system have been depicted in B.7.2., no additional information is provided in An-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
	consistent with data presented in other sections of the PDD?	,4	nex.4.		
F.1.9.	Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	1,2,3,4	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.10.	Do the additional information and / or documented procedures substantiate / support statements given in other sections of the PDD?	1,2,3,43	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

**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
<p><b><u>Corrective Action Request No.1.</u></b></p> <p>The time schedule of the implementation of the projects should be included in the PDD.</p>	A.4.3.10	<p>The time schedule of the implementation of the projects has been included in section A.4.3 of the revised PDD.</p> <p><b><u>PP response</u></b></p> <p>accordance with Annex 46, EB41, the chronology of key events in project implementation and CDM registration have now been included under section B.5. of the revised PDD.</p>	<p>The same has been incorporated in the PDD. However, the chronology of the key events (from inception till date) related to the project activity along with the CDM activity in parallel to demonstrate the serious consideration of CDM needs to be incorporated in the PDD.</p> <p><b><u>Final response from audit team</u></b></p> <p><input checked="" type="checkbox"/></p> <p>The same has been incorporated in the PDD under section B.5.</p>
<p><b><u>Corrective Action Request No.2.</u></b></p> <p>In section B.5, additionality tool version 4 is used. The same is not correct. The most recent version i.e. version 05.2 must be used. Entire section of the PDD needs to be revised as the latest version of the tool.</p>	B.1.3	<p>The most recent version of the Tool for demonstration and assessment of additionality version 05.2 have now been used to demonstrate additionality of the project. The PDD has been updated accordingly.</p>	<p><input checked="" type="checkbox"/></p> <p>The same has been incorporated in the PDD. PP has updated and used Version-05.2 to demonstrate additionality of the project. Hence the issue is resolved.</p>
<p><b><u>Corrective Action Request No.3.</u></b></p> <p>As the start date of the project activity is before validation, provide the evidence to prove that incentive from the CDM was se-</p>	B.5.1	<p>The chronology of events evidencing the prior consideration of CDM as well as CDM initiatives in parallel with the project implementation have been incorporated in the PDD.</p>	<p><input checked="" type="checkbox"/></p> <p>The same has been incorporated in the PDD in detail. In support of that PP has submitted approved DPR by Dept. of Energy and irrigation [IRL#5],</p>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
riously considered to proceed with the project activity. The same also needs to be incorporated in the PDD.			Loan agreement document [IRL#20], Contract agreement with CDM consultant [IRL#40] etc. Hence the issue is closed.
<b><u>Corrective Action Request No.4.</u></b>  A documented procedure defining roles and responsibilities for ensuring accurate data monitoring, collection, transfer and reporting needs to be developed. The procedure should also have the process of calibration of measuring equipments, data adjustments, internal audits & emergency preparedness leading to data losses.	B.7.2.1	A documented procedure defining roles and responsibilities for ensuring accurate data monitoring, collection, transfer and reporting has been developed in the form of a CDM Manual. This has been referenced in Annex 4 of the PDD and would be made available to DOE.	<input checked="" type="checkbox"/> A detail monitoring procedures has been depicted in the PDD under section B.7.2. Furthermore, PP has also developed CDM manual [IRL#46] which gives transparency of monitoring plan. A copy of draft CDM manual has been submitted to DOE. Hence the issue is resolved.
<b><u>Corrective Action Request No.5.</u></b>  Justification of project starting date needs to be included in C.1 of PDD.	C.1.1	According to EB 41, the start date should be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. The project participant entered into a rupee loan facility agreement with the senior lenders of the project activity on 26/03/2007 which represents firm commitment to expenditures related to implementation of the project and hence is considered as the project start date.	<input checked="" type="checkbox"/> PP has considered loan agreement, dated 26.03.2007 as a start date [IRL#20]. Prior to that, on 19.03.2007 the civil work contract agreement was signed (IRL#49) which is accepted as starting date of the project, in line with CDM glossary and terms to be the earliest of all events which could be considered as starting date.
<b><u>Clarification Request No. 1.</u></b>  Clarify why emission reduction figure for the first year is less compared to rest of the crediting period.	A.4.4.1	The Emission Reduction estimation for the first year is lesser than subsequent years, since the value of Capacity Index Achieved (CIA) is taken as 90% for first year and 95% for subsequent years. This is as per the assumptions made in Detailed Project Report (DPR) of the project. The relevant pages of the DPR are attached as Annexure-	<input checked="" type="checkbox"/> The relevant pages of DPR [IRL#5, 6, 7] have been submitted where it is stated that the Capacity Index Achieved (CIA)

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
		DPR herewith.	for the first year will be 90% and 95% for the subsequent year. The same has been also clarified in the PDD. Hence the issue is resolved.
<b><u>Clarification Request No. 2.</u></b> Clarify what is the source of funding for the project activity.	A.4.5.1	The funding details of the project is as under: <ul style="list-style-type: none"> <li>Project Cost : 1895.8 Million (Estimated completion cost as approved in Detailed Project Report_ Please refer Annexure-DPR)</li> <li>Equity : 20% of the total cost</li> <li>Debt (Long term): 70% of the total cost {Axis Bank Limited, formerly UTI bank, is the underwriter for this component; The loan has been arranged through four financing institutions i.e. UTI Bank, UCO bank, United Bank of India, India Infrastructure Finance company Limited (IIFCL). A copy of extract of the Rupee Loan Facility Agreement (RLFA) is being attached as the supporting document for this component as Annexure-RLFA. The overall RLFA has been made available to the DOE during site visit to BHPL Head Office}</li> <li>Sub-ordinated debt: 10% of the total cost (Axis bank has provided for this component of the debt in the form of subscription to secured Optionally Fully Convertible Debentures i.e. OFCD. Please refer the sanction letter of Axis Bank for this component as Annexure-sanction Axis bank).</li> </ul>	<input checked="" type="checkbox"/> There is no public funding involved from any annex-1 country. The funding has been made through debt and equity. Supportive for the same such as DPR [IRL#5], Rupee loan facility agreement [IRL#20] and ODA [IRL#36] has been submitted. Hence the issue is resolved.
<b><u>Clarification Request No. 3.</u></b> Why are you not discussing other renewable energy options, while discussing the baseline scenario?	B.5.2	Other renewable energy options (wind, biomass, solar etc.) have been included in the Section B.5 of the revised PDD while discussing the baseline scenario. Supportive pertaining to statements made therein have been attached as reference in Annexure-support documents section B.5.	<input checked="" type="checkbox"/> The same has been discussed in detail in the PDD under section B.5. PP has also submitted the evidence such as such as article on Solar power, MNRE Annual Reports, wind and biomass (2006-07 and 2007-

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			08)[IRL#42] for the statement made therein. Hence the issue is resolved.
<p><b><u>Clarification Request No. 4.</u></b></p> <p>The relative regulations and laws are discussed for each scenario in the PDD. However, provide some valid documents/weblink to support the statement made therein.</p>	B.5.4	Supportive documents / weblink to support the statements made pertaining to the relative regulations and laws discussed for each scenario in section B.5 of the PDD have been provided as reference to DOE. The same has been attached as reference herewith as Annexure-support documents section B.5.	<p>☑</p> <p>The web-link/footnote for the same has been provided in the PDD. PP has also submitted all the references and footnote such as <a href="http://powermin.nic.in/indian_electricity_scenario/blue%20print/executive_summary.htm">http://powermin.nic.in/indian_electricity_scenario/blue%20print/executive_summary.htm</a>. Also see CR-3. Hence the issue is resolved.</p>
<p><b><u>Clarification Request No. 5.</u></b></p> <p><b>Investment barrier:</b> According to the PDD a number of bank had been approached for funding of the project. Only one bank agreed to provide fund for this project i.e Axis Bank.</p> <p>Clarify for the same with valid documents.</p>	B.5.13	Supportive documents pertaining to the investment barrier have been shown and made available to the DOE during the site visit to BHPL Head Office.	<p>☑</p> <p>It has been shown and evidenced that PP has approached a number of banks for funding but have gotten lukewarm response. Not only has that PP also got BBB (minus) rating from CARE [IRL#24, 25] which was also one of the causes for the difficulties in getting loans. DOE has checked all those correspondence made between the banks and client [IRL#23]. Finally Axis bank agreed to sanction the loan. PP has submitted the letter of sanction of term loan [IRL#20] to the DOE. Hence the issue is resolved.</p> <p>The barrier analysis was re-</p>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
			moved and additionality established by financial analysis, for details please refer to the report above.
<b><u>Clarification Request No. 6.</u></b> <b>Institutional Barrier:</b> PDD states that project activity was the first project which awarded to an Independent Power Producer (IPP). Clarify for the same with valid documents.	B.5.13	<p>BHPL project activity was one of the first few projects in Uttaranchal to be awarded to an IPP.</p> <p>This has been substantiated by the data published on Hydro Schemes in India (Source: Hydro Power Policy 2008; attached herewith as Annexure-hydro power policy). The data provided therein indicates that there is only one hydro power project in Uttarakhand under the private sector. The said project is the 400 MW Vishnu-Prayag project. Thus, this indicates lack of private sector participation in development of SHP in Uttarakhand.</p>	<input checked="" type="checkbox"/> PP has clarified for the same and substantiated by Hydro policy: 2008[IRL#38]. In the policy only one private party is listed which is for large scale project. Based on that it is concluded that the private parties' participation is very less in that area. Hence the issue is closed. The barrier analysis was removed and additionality established by financial analysis, for details please refer to the report above.
<b><u>Clarification Request No. 7.</u></b> Please provide the supporting documents for assessing the following; <ul style="list-style-type: none"> <li>Choice of range of the size of similar plants can be well justified</li> <li>Regional scale of the assessment is well justified</li> <li>If the list of projects under the assumed (and justifiable assumptions) is complete.</li> </ul>	B.5.15	<p>A. Choice of range of the size of similar plants</p> <p>In India, hydro projects up to 25 MW station capacity have been categorized as Small Hydro Power (SHP) projects. Based on their range of capacities, SHPs are further sub-classified into :</p> <ul style="list-style-type: none"> <li>Micro : Upto 100 KW</li> <li>Mini : 101 to 2000 KW</li> <li>Small : 2001 to 25000 KW</li> </ul> <p>The above classification has been provided by Ministry of New and Renewable Energy (MNRE), an apex body under Govt. of India, mandated to look after the portfolio of small hydro power development in</p>	<input checked="" type="checkbox"/> All the three points have been precisely justified. PP has indicated the details in the PDD in more detail with all footnotes/weblink. DOE has verified all the supporting documents and web link such Classification of SHPs, MNRE, Govt. of India, development of SHPs in Uttarakhand ( <a href="http://www.uttarakhandjalvidyut.">http://www.uttarakhandjalvidyut.</a>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
		<p>India. (Please refer Annexure-mnre document)</p> <p>Thus, based on the above classification, the BHPL project activity falls in the third category i.e. between 2001 to 25000 KW.</p> <p>B. Regional scale of the assessment is well justified</p> <p>The assessment has been done considering the regional scale (i.e. projects operating in Uttarakhand) since the projects operating at the regional level take place in a comparable environment with respect to regulatory framework like the BHPL project activity. Being in Uttarakhand, these projects come under the ambit of Government of Uttarakhand (GoU) as well as the nodal agency designated by GoU to develop the hydro power potential of the state. This agency is the Uttarakhand Jal Vidyut Nigam Limited (UJVNL), which is primarily responsible for development of small hydro power projects in Uttarakhand. Further, these projects are governed by the policies framed by GoU for development of hydro-power in the state. Details on the regulatory environment for development of small hydro power projects in Uttarakhand are available on the UJVNL website (<a href="http://www.uttarakhandjalvidyut.com">http://www.uttarakhandjalvidyut.com</a>).</p> <p>C. If the list of projects under the assumed (and justifiable assumptions) is complete UJVNL is an apex body of the Government of Uttarakhand mandated for managing hydro power generation at existing power stations and development of new hydro projects with the purpose of harnessing hydro power resources of Uttarakhand. It is the most reliable source of information on small hydro projects in Uttarakhand. The list of projects taken for analysis in the revised PDD is based on the information available on the UJVNL website. (<a href="http://www.uttarakhandjalvidyut.com/small_hydroplants.htm">http://www.uttarakhandjalvidyut.com/small_hydroplants.htm</a>) – Refer Annexure-list of SHPs.</p>	com). The issue is closed now.
<p><b><u>Clarification Request No. 8.</u></b></p> <p>It must be justified for each and every project in the list how it can be excluded from detailed investigation. The reason that</p>	B.5.16	<p>The justification for listed projects has been revised in Section B.5 of the revised PDD.</p> <p>As per the information available on the small hydro power plants (plants with capacity less than 25 MW) in Uttarakhand (UJVNL web-</p>	DOE can accept the classification of hydro power project as given by MNRE. It can be noted that there is no further classifica-



## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion																																
<p>6 of the 7 listed projects are below 15MW is not a valid justification in this context. Also the exclusion of the 7th plant by referring to the canal type structure alone is not sufficient and should be substantiated by evidence.</p> <p>Please prepare and evaluate each of the listed projects according to additionality tool requirements.</p>		<p>site), majority of the 23 small hydro power plants operational in the state are less than 2 MW<sup>1</sup> i.e. most of them fall in the classification of mini or micro hydro projects. Only 7 small hydro power plants are in operation with capacities between 2 and 25 MW<sup>2</sup>.</p> <p style="text-align: center;"><b>Projects in Operation (2 to 25 MW)</b></p> <table> <tr> <th>Name of the Project</th><th>Name of River / Canal</th><th>Run-of-the-river (ROR) / Canal</th><th>Capacity (MW)</th></tr> <tr> <td>Kanchauti</td><td>Kanchautigad</td><td>ROR</td><td>2.0</td></tr> <tr> <td><u>Pathri</u></td><td>Upper Ganga Canal</td><td>Canal</td><td>20.4</td></tr> <tr> <td>Pilangad</td><td>Pilangad</td><td>ROR</td><td>2.25</td></tr> <tr> <td>Urgam</td><td>Kalpganga</td><td>ROR</td><td>3.0</td></tr> <tr> <td>Galogi</td><td>Bhattafall</td><td>ROR</td><td>3.0</td></tr> <tr> <td>Mohamadpur</td><td>Upper Ganga Canal</td><td>Canal</td><td>9.30</td></tr> <tr> <td>Relagad</td><td>Relagad</td><td>ROR</td><td>3.0</td></tr> </table> <p>All of these seven projects have been implemented by Uttaranchal Jal Vidyut Nigam Limited (UJVNL). UJVNL is a wholly owned corporation of the Government of Uttarakhand mandated for managing hydro power generation at existing power stations and development of new hydro projects with the purpose of harnessing hydro power resources of the state (Refer Annexure-UJVNL). Being public sector projects,</p>	Name of the Project	Name of River / Canal	Run-of-the-river (ROR) / Canal	Capacity (MW)	Kanchauti	Kanchautigad	ROR	2.0	<u>Pathri</u>	Upper Ganga Canal	Canal	20.4	Pilangad	Pilangad	ROR	2.25	Urgam	Kalpganga	ROR	3.0	Galogi	Bhattafall	ROR	3.0	Mohamadpur	Upper Ganga Canal	Canal	9.30	Relagad	Relagad	ROR	3.0	<p>tion of “lower scale” hydro project. It must be justified for each of the 4 projects in the list (lower scale) how it can be excluded from detailed investigation. The reason that 4 of the projects are lower scale is not valid justification in this context.</p> <p><b><u>Final response from audit team</u></b></p> <p><input checked="" type="checkbox"/> PP has clarified in detail under section B.5, common practice analysis as per new version-05.2 of the additionality tool. All of the project listed here are govt. funded (UJVNL), very less participation from private parties. PP has further substantiated this with new hydro power policy, 2008[IRL#38] where we can see only one private party is listed in the list. Therefore, It can be concluded that at the time of start of this project there were similar project falls under same scale of operation. Hence the issue is resolved.</p>
Name of the Project	Name of River / Canal	Run-of-the-river (ROR) / Canal	Capacity (MW)																																
Kanchauti	Kanchautigad	ROR	2.0																																
<u>Pathri</u>	Upper Ganga Canal	Canal	20.4																																
Pilangad	Pilangad	ROR	2.25																																
Urgam	Kalpganga	ROR	3.0																																
Galogi	Bhattafall	ROR	3.0																																
Mohamadpur	Upper Ganga Canal	Canal	9.30																																
Relagad	Relagad	ROR	3.0																																

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
		<p>these projects have easier access to funds and lower expectations in terms of financial return.</p> <p>Further there exists differences in these plants and the BHPL project activity in terms of vintage, scale, regulatory /investment climate as explained below (For additional Information on these projects, Please refer Annexure-UJVNL). Out of the 7 small hydro power plants (with capacities between 2 and 25 MW) listed above, Pathri and Mohammadpur are canal based projects, commissioned in the year 1955 and 1952 respectively. Galogi Hydropower station is also one of the oldest running power houses in the country commissioned in 1907. The remaining four projects are of lower scale i.e between 2 to 3 MW. BHPL project activity varies substantially from the seven public sector projects on account of different regulatory environment, vintage, scale as well as ease of access to funds. The other projects do not face barriers related to access of funds / policy framework of the Government of Uttarakhand, unlike the BHPL project. Being of older vintage, these projects were commissioned in different circumstances. Thus, the BHPL project activity is not comparable to these projects. Further, the lack of private players for range of capacities between 2 to 25 MW, in spite of the vast unexplored potential for development of small hydro power in the state of Uttarakhand, reinforces the unattractiveness of such projects for private players as well as the barriers listed above.</p> <p><b><u>PP Response</u></b></p> <p>The common practice analysis has been revised and a definition of the similar project activities for comparison against the proposed project activity has been included. Since there is practically no private sector investment in small hydro projects under operation in Uttarakhand, it can be justifiably concluded that there are no similar projects in the region.</p>	
<p><b><u>Clarification Request No. 9.</u></b></p> <p>Please provide the excel spreadsheet utilized for the EF calculation.</p>	B.6.1.1	<p>EF calculation is based on the Carbon Dioxide Emission Factor database, version 3.0, given by Central Electricity Authority (CEA), a statutory body under the Ministry of Power, Government of India. CEA has estimated the Combined Margin emission factor for various grids in India. Excel spreadsheet utilized for EF calculations has been refe-</p>	<p>Emission reduction calculation sheet needs to be revised as per the new data base i.e. version-4.</p> <p><b><u>Final response from audit</u></b></p>

## Validation Protocol

Project Title: 24 MW Bhilangana - III Hydro Power Project

Date of Completion: 2010-02-22

Number of Pages: 46



Industrie Service


Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
		<p>renced from the CEA website:  <a href="http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm">http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm</a>.                      These have been included in the CER calculation sheet as Annexure-CER.  <b>PP Response</b>                      The emission reductions sheet is updated with revised CEA database Version 4.0 and the same has also been incorporated in the revised PDD.</p>	<p><b>team</b>  <input checked="" type="checkbox"/>                      The emission reduction calculation has been revised as per new CEA database version-4.                      Hence the issue is resolved.</p>
<p><b><u>Clarification Request No. 10.</u></b>                      Under section A.1 the PDD completion date is mentioned 4th Jan, 2008 and the base-line completion date is also 4<sup>th</sup> Jan, 2008. Clarify for the same.</p>	B.8.2	<p>The PDD completion date has been revised accordingly. Please refer section A.1 for the required revision.</p>	<p><input checked="" type="checkbox"/>                      The same has been corrected in the revised PDD. Hence the issue is resolved.</p>

Validation of the CDM Project:  
24 MW Bhilangana - III Hydro Power Project




Industrie Service


## **Annex 2: Information Reference List**

2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 1 of 8	 Industrie Service
------------	---	----------------	--

Reference No.	Document or Type of Information												
1.	<p>On-site interviews at the project site of Bhilangana III hydro project conducted on 25/05/2008 to 27/05/2008 by the auditing team of TÜV SÜD:</p> <p>Validation team:</p> <table> <tr> <td>Bratin Roy</td><td>TÜV SÜD South Asia, India</td></tr> <tr> <td>Sebastian Randig</td><td>TUV SUD Industrie Service GmbH</td></tr> </table> <p>Interviewed persons:</p> <table> <tr> <td>Mr. Rajesh Jindal</td><td>Bhilangana Hydro Power Ltd.</td></tr> <tr> <td>Ms. Amit Agarwal</td><td>Bhilangana Hydro Power Ltd.</td></tr> <tr> <td>Mr. Sachin Pahuja</td><td>Bhilangana Hydro Power Ltd.</td></tr> <tr> <td>Ms. Shuchi Malhotra</td><td>Consultant</td></tr> </table>	Bratin Roy	TÜV SÜD South Asia, India	Sebastian Randig	TUV SUD Industrie Service GmbH	Mr. Rajesh Jindal	Bhilangana Hydro Power Ltd.	Ms. Amit Agarwal	Bhilangana Hydro Power Ltd.	Mr. Sachin Pahuja	Bhilangana Hydro Power Ltd.	Ms. Shuchi Malhotra	Consultant
Bratin Roy	TÜV SÜD South Asia, India												
Sebastian Randig	TUV SUD Industrie Service GmbH												
Mr. Rajesh Jindal	Bhilangana Hydro Power Ltd.												
Ms. Amit Agarwal	Bhilangana Hydro Power Ltd.												
Mr. Sachin Pahuja	Bhilangana Hydro Power Ltd.												
Ms. Shuchi Malhotra	Consultant												
2.	Project Design Document, Version 01 dated 04.01.2008.												
3.	Approved consolidated baseline methodology ACM0002, version 08.												
4.	UNFCCC homepage <a href="http://www.unfccc.int">http://www.unfccc.int</a> .												
5.	DPR (Detailed Project Report), dated January 2006, Submitted 16.06.08.												
6.	Letter of submission of DPR, dated 30.01.2006, Submitted 16.06.08.												
7.	Letter of approval of DPR, dated 20.04.2006, Submitted 16.06.08.												
8.	Project Schedule as per DPR and internal schedule, Submitted 16.06.08.												
9.	Contract agreement with M/s Volth Siemens Hydro Pvt. Ltd. Agreement-1 ,dated 10.07.2007, Submitted 16.06.08.												
10.	Contract agreement with M/s Volth Siemens Hydro Pvt. Ltd. Agreement-2, dated 10.07.2007, Submitted 16.06.08.												
11.	Letter from Supplier of EM Equipment, dated 22.05.2008, Submitted 16.06.08.												
12.	Project development agreement – Government of Uttarakhand ,dated 21.11.2003, Submitted 16.06.08												
13.	Uttaranchal Jal Sansthan- NOC Appl., dated 01.09.2006, Submitted 16.06.08.												
14.	NOC Uttaranchal Jal Sansthan, dated 01.09.2006, Submitted 16.06.08.												
15.	Uttaranchal Pollution control board/Consent to operate- NOC Appl., dated 21.08.2006 , Submitted 16.06.08.												
16.	NOC Uttaranchal Pollution control board/Consent to operate, dated 07.12.2006, Submitted 16.06.08.												
17.	Letter from Ministry of Environment & Forest regarding applicability of EIA, dated 26.10.2006, Submitted 16.06.08.												
18.	Copy of PPA, dated 27.12.2007, Submitted 16.06.08.												
19.	Copy of project sketch , Submitted 16.06.08.												
20.	Abstract of loan document, dated 26.03.2007, Submitted 16.06.08.												
21.	Copy of board resolution, dated 22.02.2006, Submitted 16.06.08.												
22.	Implementation agreement, dated 25.01.2007, Submitted 16.06.08.												


2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 2 of 8	 Industrie Service
------------	---	----------------	--

Reference No.	Document or Type of Information																				
23.	<p>Corresponded with various banks with lukewarm response, Submitted 16.06.08.</p> <p>In particular with:</p> <ul style="list-style-type: none"><li>A) State Bank of Mysore</li><li>B) State Bank of Hyderabad ("SBOH")</li><li>C) IDBI</li></ul> <p>The communication basically serves as proof for two issues.</p> <ul style="list-style-type: none"><li>1) It shows that PP was actively searching for loans to get the project financed.</li><li>2) It shows that PP was unable to secure financing of the project without help of the CDM</li></ul> <p>Detailed communication as follows:</p> <table><tr><td><b>A</b></td><td colspan="4"><b>State Bank of Mysore</b></td></tr><tr><td></td><td>Event</td><td>Date</td><td>Remarks</td><td>Reference</td></tr><tr><td>23.11.</td><td>Letter from bank raising queries</td><td>22-Apr-06</td><td>The State Bank of Mysore was approached by the PP seeking funding for the project. The bank sent its preliminary queries on the project with respect to status of project clearances and sought clarification from the PP on high debt equity ratio and average DSCR</td><td>ADV/BHPL/383/06-07 dated 22/04/2006</td></tr><tr><td>23.1.2</td><td>Reply to bank for the queries</td><td>28-Apr-06</td><td>The PP tried to provide a detailed clarification to the bank on its queries</td><td>Reply from BHPL dated 28/04/2006</td></tr></table> <p>There was no response from the bank post PP clarification on its queries</p>	<b>A</b>	<b>State Bank of Mysore</b>					Event	Date	Remarks	Reference	23.11.	Letter from bank raising queries	22-Apr-06	The State Bank of Mysore was approached by the PP seeking funding for the project. The bank sent its preliminary queries on the project with respect to status of project clearances and sought clarification from the PP on high debt equity ratio and average DSCR	ADV/BHPL/383/06-07 dated 22/04/2006	23.1.2	Reply to bank for the queries	28-Apr-06	The PP tried to provide a detailed clarification to the bank on its queries	Reply from BHPL dated 28/04/2006
<b>A</b>	<b>State Bank of Mysore</b>																				
	Event	Date	Remarks	Reference																	
23.11.	Letter from bank raising queries	22-Apr-06	The State Bank of Mysore was approached by the PP seeking funding for the project. The bank sent its preliminary queries on the project with respect to status of project clearances and sought clarification from the PP on high debt equity ratio and average DSCR	ADV/BHPL/383/06-07 dated 22/04/2006																	
23.1.2	Reply to bank for the queries	28-Apr-06	The PP tried to provide a detailed clarification to the bank on its queries	Reply from BHPL dated 28/04/2006																	


2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 3 of 8	 Industrie Service
------------	---	----------------	--

Reference No.	Document or Type of Information				
	<b>B</b>	<b>State Bank of Hyderabad ("SBOH")</b>			
		Event	Date	Remarks	Reference
	23.2.1	Minutes of meeting with bank official of SBOH	14-Feb-06	The PP had a meeting with the officials of the State Bank of Hyderabad with respect to funding for the project.	Minutes of meeting dated 17/02/2006
	23.2.2	Submission of documents asked by the bank during meeting dated 14th Feb., 06	15-Feb-06	Submission Certificate of Incorporation and commencement of business	Submission letter from Polyplex to SBH
	23.2.3	Letter stating that repayment period and DSCR is not acceptable	8-May-06	The Bank rejected the proposal of PP to reduce the repayment period from 14 years to 10 years (as per CERC guidance) since it resulted in a very low DSCR which was unacceptable to the bank for funding the project. The Bank requested the PP to submit revised projections for the repayment period under consideration.	F/Bhilangana dated 08/05/2006
	23.2.4	Meeting with bank official of SBOH	31-May-06	The PP met officials of the Bank and tried to clarify their concerns.	Meeting
	23.2.5	Letter to bank addressing the queries	2-Jun-06	Post meeting with the Banks, the PP sent official replies to the Queries raised by the Bank during their meeting.	Letter from BHPL to SBOH dated 02/06/2006
	There was no response from the bank post PP clarification on its queries				




2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 4 of 8	 Industrie Service
------------	---	----------------	--


Reference No.	Document or Type of Information				
	<b>C</b>	<b>IDBI</b>			
		Event	Date	Remarks	Reference
	23.3.1	Start Date	9-Mar-06	Application of grant of assistance to the IDBI Bank from BHPL	Letter from BHPL to IDBI dated 09/03/2006
	23.3.2	Query Letter from Bank	4-Apr-06	The bank sought clarification from the PP on various issues with respect to the status of project clearances, reasons for executing the project on item rate basis, write up on CDM and explanation on how it has been incorporated in the profitability estimates.	HO/PAD/BHPL dated 04/04/2006
	23.3.3	Exchange of information and documents between bank and company		BHPL sent its detailed proposal to the Bank	Various correspondences
	23.3.4	Response to bank for the queries raised vide letter dated 04th April, 06	10-Apr-06	BHPL/PP submitted explanations/clarification to the Bank's queries with detailed explanation on all its concerns and highlighting importance of CDM and its inclusion in the profitability estimates	Letter from BHPL dated 10/04/2006
	23.3.5	Exchange of information and documents between bank and company		Various correspondences happened between the Bank and the PP highlighting exchange of detailed information and clarifications on the critical elements of the project	Various correspondences
	23.3.6	Meeting with IDBI official	24-Apr-06	The PP met officials of the Bank and tried to clarify their concerns.	Meeting
	23.3.7	Response to the query raised	17-May-06	Response to the query raised during the meeting dated 24th April, 2006	Letter from BHPL to IDBI dated 17/05/2006
	23.3.8	Exchange of information & documents between bank and company through mails & hard copies	18-05-06 to 27-06-06	Further exchange of information on various issues between the PP and the Bank illustrating difficulty in convincing the Bank	Various email correspondences

2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 5 of 8	 Industrie Service
------------	---	----------------	--


Reference No.	Document or Type of Information				
	23.3.9	Submission of brief note on equity contribution in B-III	28-Jun-06	The PP submitted a detailed note on the equity contribution for the project to the Bank highlighting shareholding information, Balance sheet details etc. to justify the ability of the PP to meet it's the project equity requirements	Letter from BHPL to IDBI dated 28/06/2006
	23.3.10	Letter from bank seeking disclosure of interest	22-Jul-06	The Bank further sought disclosure of interest as per RBI Guidelines on the connected lending	Fax Message from IDBI Bank
	23.3.11	Reply of the above letter	25-Jul-06	The PP submitted the details of the Director's of the company and confirming no involvement of any of the Director's with IDBI Bank	Letter from BHPL to IDBI dated 25/07/2006
	23.3.12	Correspondence between bank and company through mails & hard copies	till 6th September, 2006	There was no end to the queries from the Bank and there was further exchange of information / correspondences between the PP and the Bank	Various correspondences
	There was no response from the bank post PP clarification on its queries				
24.	Credit Analysis and research Ltd (Care) rating Bhilangana Hydro Power Ltd. as "CARE BBB-" (Tripply B minus) evidence letter, dated 06.09.2006, Submitted 16.06.08.				
25.	Rationale of the Care rating evidence (IRL24 above), providing in depth risk analysis of Bhilangana project investment, Submitted 16.06.08.				
26.	Under protest payment letter to GOU for payment, dated 12.09.2003, Submitted 16.06.08.				
27.	Stake holder invitation letter, dated 29.11.2007, Submitted 16.06.08.				
28.	Stake holder Brochure, November, 2007, Submitted 16.06.08.				
29.	Stakeholder meeting attendance record, dated 29.11.2007, Submitted 16.06.08.				
30.	Minutes of stakeholder meeting, dated 29.11.2007, Submitted 16.06.08.				
31.	Sample questionnaire filled up by stakeholder, dated 27.11.2007, Submitted 16.06.08.				
32.	EIA document, Submitted 16.06.08.				
33.	Payment to forest department and forest land lease, dated 17.05.2007, Submitted 16.06.08.				
34.	Host Country Approval, dated 17.03.2008, Submitted 16.06.08.				
35.	Stake Holder Photographs, Submitted 16.06.08.				
36.	ODA Letter, dated 23.05.2008, Submitted 16.06.08.				

2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 6 of 8	
------------	---	----------------	---

Reference No.	Document or Type of Information																									
37.	Modalities of Communication, dated 23.05.2008, Submitted 16.06.08.																									
38.	Hydro power Policy -2008, Ministry of Power, Submitted 4.12.2008.																									
39.	Email from the CDM consultants to BHPL with CDM advisory proposal, dated 15.03.2007, Submitted 4.12.2008.																									
40.	Engagement letter between BHPL and the CDM consultants for CDM services, dated 02.08.2007, Submitted 4.12.2008.																									
41.	List of SHPs, Uttarakhand Jal vidyut Nigam Limited, Submitted 4.12.2008.																									
42.	Article on Solar Power, The Economic Times, dated 10.11.2007, <a href="http://www.indianwindpower.com/potential.html">http://www.indianwindpower.com/potential.html</a> , and MNRE Annual Reports (2006-07 and 2007-08), Submitted 4.12.2008.																									
43.	Impact of silt on hydro turbines, dated Oct,12-13 <sup>th</sup> 2006, Submitted 4.12.2008																									
44.	Silting Problems in Hydropower plants, dated Sept. 26-28 <sup>th</sup> 2001, Submitted 4.12.2008																									
45.	Report of the Expert Committee on Glaciers ( <a href="http://gov.ua.nic.in/dmmc/newsletter/finalreport.doc">gov.ua.nic.in/dmmc/newsletter/finalreport.doc</a> ) , Submitted 4.12.2008																									
46.	CDM Mannual template, BHPL, Submitted 4.12.2008.																									
47.	Project Design Document, Version 04 dated 07.05.2009.																									
48.	<p><b>Communication with Axis Bank Limited (Formerly known as "UTI Bank")</b> Basically the communication with Axis Bank Limited (Formerly known as "UTI Bank") demonstrates following:</p> <p>1) Tthe difficulty the PP was facing while applying for the loan: 2) The awareness of the bank of a number of risks attached to the investment of Bhilangana project 3) The granting of the loan based on the serious CDM consideration.</p> <table><tr><th>ILR#</th><th>Event</th><th>Date</th><th>Remarks</th><th>Reference</th></tr><tr><td>48.1</td><td>Receipt of proposal from bank</td><td>27-Feb-06</td><td>Bank proposal for financial Advisory, Arranging and Underwriting Services dated 27/02/2006</td><td>UTIB/CM/NZO/2005-06</td></tr><tr><td>48.2</td><td>Meeting with UTI Bank</td><td>30-Mar-06</td><td>Discussion on likely terms for funding Bhilangana III Project. The discussions brought out the risk of interest reset which was to be borne by the PP.</td><td>Minutes of meeting dated 30/03/2006</td></tr><tr><td>48.3</td><td>Discussion between bank &amp; company</td><td>March 06-July 06</td><td>Exchange of documents &amp; information through mails &amp; hard copies to finalise the proposal. The final proposal laid down heavy security/undertakings</td><td>Email Correspondence from UTI Bank to BHPL</td></tr><tr><td>48.4</td><td>Award of underwriting assignments</td><td>13-Jul-06</td><td>Underwriting assignment for the funding of Bhilangana III project was awarded to UTI Bank. The PP had no other option but to agree to the</td><td>Underwriting assignment from</td></tr></table>	ILR#	Event	Date	Remarks	Reference	48.1	Receipt of proposal from bank	27-Feb-06	Bank proposal for financial Advisory, Arranging and Underwriting Services dated 27/02/2006	UTIB/CM/NZO/2005-06	48.2	Meeting with UTI Bank	30-Mar-06	Discussion on likely terms for funding Bhilangana III Project. The discussions brought out the risk of interest reset which was to be borne by the PP.	Minutes of meeting dated 30/03/2006	48.3	Discussion between bank & company	March 06-July 06	Exchange of documents & information through mails & hard copies to finalise the proposal. The final proposal laid down heavy security/undertakings	Email Correspondence from UTI Bank to BHPL	48.4	Award of underwriting assignments	13-Jul-06	Underwriting assignment for the funding of Bhilangana III project was awarded to UTI Bank. The PP had no other option but to agree to the	Underwriting assignment from
ILR#	Event	Date	Remarks	Reference																						
48.1	Receipt of proposal from bank	27-Feb-06	Bank proposal for financial Advisory, Arranging and Underwriting Services dated 27/02/2006	UTIB/CM/NZO/2005-06																						
48.2	Meeting with UTI Bank	30-Mar-06	Discussion on likely terms for funding Bhilangana III Project. The discussions brought out the risk of interest reset which was to be borne by the PP.	Minutes of meeting dated 30/03/2006																						
48.3	Discussion between bank & company	March 06-July 06	Exchange of documents & information through mails & hard copies to finalise the proposal. The final proposal laid down heavy security/undertakings	Email Correspondence from UTI Bank to BHPL																						
48.4	Award of underwriting assignments	13-Jul-06	Underwriting assignment for the funding of Bhilangana III project was awarded to UTI Bank. The PP had no other option but to agree to the	Underwriting assignment from																						

2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 7 of 8	
------------	---	----------------	---

Reference No.	Document or Type of Information				
				heavy security undertakings against the funding.	BHPLK to UTI Bank
	48.5	Query letter from UTI Bank	17-Jul-06	The bank reviewed the Bhilangana proposal and sought clarification on major risks associated with project which had a direct bearing on the ability of PP to repay the debt (e.g. very high capital cost as compared to similar projects, presence of high silt in the river, requirement of a very long transmission line, inaccessibility to site and geological uncertainty in the area). The bank also challenged the inclusion of cash flow from CDM in light of the uncertainty related to availability of the CDM revenues. It also stressed that non availability of CDM revenues by the project, would significantly reduce the DSCR of the project and would make financially unviable	UTIB/NZO/CM/06-07 dated 17/07/2006
	48.6	Reply of query letter	21-Jul-06	The PP faced significant challenges to clarify the concerns of the bank since the issues brought out by the bank were real risks/barriers to the implementation of the project. However, they tried to convince the bank and highlighted their past experience with implementation of hydro projects and also successful registration of its earlier projects under UNFCCC	Detailed response from BHPL to UTI through its letter dated 21/07/2006
	48.7	Receipt of term sheet	11-Aug-06	Since the PP had a adverse experience with other financial institutions to secure funding for the project, PP agreed to the strict terms and conditions of UTI bank.	UTIB/NZ/06-07 dated 11/08/2006
	48.8	Letter of assurance with respect to availability of CDM	23-Aug-06	Further, the PP had to submit a Letter of Assurance to the UTI Bank on its request for the availability of CDM benefits for the said project. The PP had to assure the bank that it would take all requisite measures at its own cost to secure CDM benefits for the project and would report to the bank periodically on the status of CDM.	Letter of assurance dated 23/08/2006 from BHPL to UTI Bank
49.	Civil Contract Agreement marking the projects start according to CDM glossary, dated 19.03.2007				
50.	CER calculation sheet				
51.	EF calculation sheet				
52.	Additionality tool, version-05.2				

2010-02-22	Validation of the "24 MW Bhilangana - III Hydro Power Project".  Information Reference List CDM	Page 8 of 8	 Industrie Service
------------	---	----------------	--

Reference No.	Document or Type of Information
53.	Tool to calculate the emission factor for an electricity system, version 01.1
54.	Letter to Principal Secretary GOU along with cheque containing incremental payment amount dated 25.05.2006
55.	Project IRR calculation spreadsheet
56.	UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations dated 14 <sup>th</sup> May 2004
57.	Extracts of DPR for assumptions in investment analysis
58.	Extracts of DPR for values of energy generation
59.	Extracts of DPR for total cost of project
60.	CA Certificate dated 18.11.2009
61.	WACC Benchmark calculation sheet
62.	Project Design Document, Version 05 dated 22.02.2010.