



VALIDATION REPORT

- VOLUNTARY EMISSION REDUCTION -

MALANA POWER CORPORATION LIMITED

“86 MW HYDRO PROJECT IN HIMACHAL
PRADESH”

Report No: 53213807- 07/36

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Date of validation opinion: 2007-04-25	Project No.: 53700307-07/36 Rev. 0
Approved by: Mr. Rainer Winter	Organisational unit: TÜV NORD JI/CDM Certification Program
Client: Malana Power Company Limited	Client ref.: Mr. O. P. Ajmera, Vice President & CFO

Summary/Opinion:									
Project Title	86 MW Hydro Project in Himachal Pradesh								
Name of Project Participant	M/s. Malana Power Company Limited (MPCL)								
Submitted PDD	Version 2: 86 MW Hydro Project in Himachal Pradesh (dated 25/12/2006)								
Approved CDM Methodology used for Validation	ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 06 date: 19/05/2006)								
Scope of Validation	The scope of this engagement covers the validation of voluntary Greenhouse Gas emission reductions generated by the above-mentioned project activity for first renewable crediting period. The validation is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on Approved methodology ACM0002 / Version 06, Sectoral Scope: 1, 19/05/2006, Consolidated baseline methodology for grid-connected electricity generation from renewable sources, which are included in the PDD ^{PDD/} and other relevant supporting documents.								
Validation Opinion	TÜV NORD JI/CDM Certification Program has validated the project activity as per the relevant requirements of the VCS- version-I and CDM rule frame of UNFCCC applicable for VER project activities, as well as criteria for consistent project operations, monitoring and reporting. The review of the PDD and additional documents related to baseline and monitoring methodology; the subsequent background investigation to validate the fulfilment of the stated criteria of the VCS- version-I. The validation is based on the Project Design Document (PDD), dated 25th December 2006 Version-2, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant. As a result of the validation, the validation team confirms that: • All operations of the project are implemented and installed as planned and described in the validated project design document. • The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions can be achieved within the 10 years (fixed) crediting period. • The monitoring system is in place and functional. The project is ready to generate GHG emission reductions. • The project additionality is sufficiently justified in the PDD. • The monitoring plan is transparent and adequate. As the result of the validation, the validator confirms that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation. <table> <tr> <td>Baseline Emissions over crediting period</td> <td>2,605,584 t CO_{2eq}</td> </tr> <tr> <td>Leakage</td> <td>0 t CO_{2eq}</td> </tr> <tr> <td>Project Emissions</td> <td>0 t CO_{2eq}</td> </tr> <tr> <td>Total Emission Reduction estimated over crediting period</td> <td>2,605,584 t CO_{2eq}</td> </tr> </table>	Baseline Emissions over crediting period	2,605,584 t CO_{2eq}	Leakage	0 t CO_{2eq}	Project Emissions	0 t CO_{2eq}	Total Emission Reduction estimated over crediting period	2,605,584 t CO_{2eq}
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Project Emissions	0 t CO_{2eq}								
Total Emission Reduction estimated over crediting period	2,605,584 t CO_{2eq}								

Report No.: 53700307-07/36	Subject Group: Environment
Work carried out by: Asim Kumar Jana, Manu Maudgal, Vivek Sadevra (Trainee), Srikanth Meesa (Trainee)	
Work verified by: Mr. Rainer Winter	

Indexing terms

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Abbreviations

BAU	Business as usual
CR	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Energy Authority
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CR	Clarification Request
EB	CDM Executive Board
EVI	Emergent Ventures India Pvt. Ltd.
GHG	Greenhouse gas (es)
IPCC	Intergovernmental Panel on Climate Change
kW	Kilowatt
kWh	Kilowatt hour
MPCL	Malana Power Company Limited
MU	Million Units (of electricity)
MW	Megawatt
MWh	Megawatt hour
NCV	Net Calorific Value of Fuel
PDD	Project Design Document
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCU	Voluntary Carbon Unit

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1 INTRODUCTION

Malana Power Company Limited (MPCL), facilitated by Emergent Ventures Private Limited (EVI), has commissioned the JI/CDM Certification Program (CP) of TÜV NORD CERT GmbH to validate the project:

"86 MW Hydro Project in Himachal Pradesh".

with regard to the relevant requirements for CDM project activities.

1.1 Objective

The purpose of this validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the contents of Voluntary Carbon Standard ^{/VCS/} and relevant requirements of UNFCCC-CDM rules ^{/unfccc/}; and
- other relevant rules, including the host country (India) legislation

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the credibility of the project and its intended generation of Voluntary Carbon Unit (VCUs). This validation also serves the basis of carrying out the verification of the generated VCUs.

1.2 Scope

The scope for validation includes preparation and submission of the Project Design Document (PDD), proof of title for the proposed project, and other proof of project implementation by the project owner. The TÜV NORD Cert GmbH as a DOE is involved in an independent and objective review of the PDD, in particular, the project's baseline study, additionality justification, monitoring plan and other relevant supporting documents against the requirements as given in the Voluntary Carbon Standard (VCS) Version 1 - Verification and Certification Protocol using the approved large scale CDM methodology ACM0002; and TÜV NORD umbrella validation-verification-crediting standard for voluntary off-set projects.

The items to be covered by the DOE in the validation process are described below:

VER Project Description

- Project boundaries
- Project design
- Predicted project GHG emissions

Project Baseline

- Baseline methodology
- Baseline GHG emissions

Monitoring Plan

- Monitoring Plan methodologies and intervals
- Indicators/data to be monitored and reported
- Responsibilities
- External verification

Final Validation reporting with opinion of validation

Registration of the project by TÜV NORD JI / CDM Certification Program (JI/CDM CP) of TÜV NORD Cert GmbH

The information included in the PDD and the supporting documents were reviewed against the requirements and criteria mentioned above.

Currently the project activity is meant to generate Voluntary Carbon Units (VCU). Thus the UNFCCC criteria for CDM are not fully applied. The following items was excluded in the course of the Validation, Verification and Certification (VVC) process :

- Global/local stakeholder consultation process
- Assessment of Participation Requirements
- Host country requirements/ criteria (e.g. approval procedures)
- Sustainable development criteria.

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

1.3 GHG Project Description

1.3.1 Project Scope

The considered GHG project can be classified as a VER project in the sector given in Table 1-1 (according to List of Sectoral Scopes of UNFCCC).

Table 1-1: Project Scope

No.	Project Scope
1	Energy Industries (renewable - / non-renewable sources)

1.3.2 Project Entities

The following entities are involved in the developing of the project:

Project Proponent: Malana Power Company limited
Bhilwara Towers, A-12, Sector-1
Noida -201301 (NCR-Delhi), India

Contact person: Mr. O. P. Ajmera
Tel +91-120-2536784
Fax +91-120-2531648, 2531745
opajmera@lnjbhilwara.com

Project Consultant: Emergent Ventures India Pvt. Ltd
II C-141, Ridgewood Estate, DLF Phase-IV
Gurgaon, Haryana, India

Contact Person: Mr. Ashutosh Pandey
Tel (Fax) +91 124 5102980
Mobile : +91 93125 47154
E-mail: ashutosh@emergent-ventures.com

1.3.3 Project location

The project is located at Jari village in district Kullu of Himachal Pradesh around 25 Km from Bhunter. The Project Power House Coordinates are uniquely identified as: Latitude - 32°0.2' N; Longitude - 77 ° 14.5 ' E. The nearest railway station from the project site is Kiratpur Sahib, about 198 Km from Bhunter. Bhunter has airport and is well connected to Delhi.

1.3.4 Technical project description

The project activity entails installation of two hydro turbines of capacity 43 MW each along with other auxiliary devices implemented at village Jari, Kullu District, Himachal Pradesh. The project activity was commissioned on 5th July 2001; and is currently in operation. The project exports electricity on an average of 370 GWh per year.

The electricity generation from renewable sources (hydro) is a carbon neutral energy input and is intended to reduce CO₂ emissions to the extent of equivalent electricity replaced by fossil fuels based power plant in northern region grid of India. The project activity is expected to deliver **2,605,584** tCO₂e over the chosen 10-years "non-renewable crediting period" as per PDD^{/PDD/}.

The estimated amount of emission reductions over the chosen 10-years "renewable crediting period" is **2,605,584** tCO₂e for the crediting period July 2001 to June 2011.

2 VALIDATION TEAM

- The Validation Team was led by **Asim Kumar Jana**, TÜV Nord - Mumbai, India. Mr. Jana, M.Tech (Env Engg), Dipl in Industrial Safety, is a TÜV-CERT Lead auditor for ISO 9001/14001 and OHSAS 18001. He is Head - CDM Certification for TÜV Nord India operation and holds energy auditorship from Bureau of Energy Efficiency of India. He is an appointed assessor for JI/CDM certification program of TÜV Nord. For this validation he was assisted by:
- **Mr. Manu Maudgal**: TÜV NORD- Delhi, India is a TÜV-CERT Lead auditor for ISO 9001/14001. Is PG Diploma in Environmental Management, B.Tech in Chemical Engineering. He is an appointed Assessor for JI/CDM certification program of TÜV NORD Cert GmbH and participated already several CDM project validation and verification.
- **Mr. Vivek Sadevra**: TÜV Nord-Delhi, India. Is PG Diploma in Environmental Management, M.Sc (Environment Science) and B.Sc (Environment Science) and is an appointed CDM Analyst and participated in the validation as trainee.
- **Mr. Srikanth Meesa**: TÜV Nord-Delhi, India. He is M.Tech (Environmental Engineering & Management), B.E (Civil Engineering) and is an appointed CDM Analyst and participated in the validation as trainee.
- The final validation report is verified by:



- **Mr. Rainer Winter.** Mr. Winter works at TÜV NORD as ISO 9001/ 14001 Auditor and environmental verifier for EMAS. He is also an approved emission verifier within the European Emission Trading Scheme. Mr. Winter is an authorized JI/CDM assessor and is in charge of the JI/CDM Certification Program of TÜV NORD.

3 METHODOLOGY

3.1 Methodology

The validation and subsequent verification process of the proposed VER project activity followed the sequence of steps presented below:

3.1.1 Baseline and Monitoring Methodology Check

TUV NORD assessment team determined whether the simplified baseline and/or monitoring methodology employed by the project is as per the latest version of the approved simplified baseline and monitoring methodologies under Category ACM0002 i.e., "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

3.1.2 Pre-Validation Process

It consists of following steps:

- *Assessment using Validation Protocol:* For cost-effective and systematic validation of the large-scale VER project, one generic protocol was used as the documented backbone of a transparent validation process. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria.
- *Review of Documents:* The PDD submitted by the Consultant on behalf of the Project Owner and supporting background documents related to the project design and baseline study as well as monitoring plan was reviewed by the DOE. Furthermore, the validation team may use additional documentation or checklist by third parties like host-party legislation, technical reports referring to the project design or to the basic conditions and technical data. The document review established to what degree the presented documents meet the established validation criteria. The findings of initial document review was presented to the consultant and the project owner.
- *Validation interviews:* Interviews (by telephone or e-mail or personal visit) with project stakeholders may prove useful or even necessary in order to discuss and validate issues related to project baseline and additionality and to resolve issues identified in the document review. For discussions related to the technical implementation or financing of the project, follow-up interviews with the project developer was conducted.

- **Pre-Validation reporting:** The pre-validation report facilitates the joint effort between the Project Owner and the assessment team to develop and document answer(s) and conclusions to requirements, which are considered applicable for large-scale VER projects. The independent validation exercise and subsequent discussions given in the report enabled the project proponent to address any concerns the DOE may have raised related to the project, and how these may be clarified.

In order to remedy any mistakes, problems or any other outstanding issues that is needed to be clarified for positive conclusion on the project design, Corrective Action Requests (CAR) or Clarification Requests (CR) may be raised. All CRs and CARs, if applicable, are reported and elaborated in terms of implication of CRs and CARs issued in the draft validation report. In the event of issuance of CARs/ CRs, the Project Owner have to close CARs and respond to CRs before the validation could be completed.

3.1.3 Resolution of CAR and CR

The CARs and CRs stated in the pre-validation report have to be resolved by the Project Owner, if these are issued. The requests can be resolved or "closed out" by the project owner by modifying the project design and by rectifying and updating the project design documentation. If this is not done in the final stages of the validation, it may cause the project not be recommended for TÜV NORD JI/CDM CP registration, or cause the expected emission reductions not to be subsequently verified and certified.

3.1.4 Final Validation Reporting and Validation Opinion and Registration

The final validation report reflected the results from any adjustments made to the project after the submission of pre-validation report. It will in its appearance look much like the pre-validation report, but will now reflect the responses to corrective actions and clarification requests, discussions and revisions of project documents. Thus, the final validation report should give the final conclusions regarding the project's conformance with the relevant VCS requirements. The validation report may raise issues that need to be subsequently addressed during project implementation, like the implications of any remaining corrective action requests not resolved during the validation.

The final validation report shall include a validation opinion which either forms the basis for TÜV NORD JI/CDM CP opinion of the project or which explains the reason for non-acceptance if the project is judged not to fulfil validation requirements.

3.2 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements that a CDM project is expected to meet;
- It ensures a transparent validation process where the independent entity will document how a particular requirement has been validated and the result of the determination.

The validation protocol consists of two tables: Table 1 (Validation/ Verification Minimum Criterion Checklist (*customized based on VCS version 01¹ and the applicable CDM criterion² at the time of PDD/MR submission*)); and Table 2 (Resolution of Corrective Action and Clarification Request).

The completed validation protocol is enclosed in Annex I to this report. No Corrective Action Requests and Clarification Requests have been identified.

3.3 Review of Documents

The draft PDD^{/PDD/} submitted by the MPCL in April 2007 and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like technical reports referring to the project design or to the basic conditions and technical data.

The documents that were considered during the (pre-) validation process are given in chapter 6 of this report. They are listed as follows:

- Documents provided by the project proponent (Table 6-1)
- Background investigation and assessment documents (Table 6-2)
- Websites used (Table 6-3)
- List of interviewed persons (Table 6-4)

In order to ensure the transparency of the decision making process, the reference codes listed in tables 6-1 to 6-4 are used in the validation protocol and – as far applicable – in the report itself.

3.4 Follow-up Interviews

On 25th April 2007, the TÜV NORD JI/CDM CP performed the validation interviews with the project proponent, project developer and plant operating personnel to confirm selected information and to resolve issues identified in the document review.

¹ www.ieta.org

² <http://cdm.unfccc.int>

The key interviewed persons and the main topics of the interviews are summarised in Table 3-1.

Table 3-1 Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives (MPCL)	- Chronological description of the project activity - Technical details of the project realisation - Baseline scenario, operation of project activity, technical details of project activity, procedure of energy metering. - Monitoring and measurement equipment - Crediting period and its starting date - Project activity starting date - Sustainable development issues - Analysis of local stakeholder consultation - Operational data – technical specification (capacity of project), operational lifetime, PLF. - Training and competency of the staff members w.r.t project management, monitoring and reporting - Sources of finance for project activity, barrier of project activity - Stakeholder consultation - Socio-economic issues / benefits because of project - Operation and maintenance of Hydel Power Project terms and condition for service, supply of guaranteed power to regional grid.
Project Developer (Emergent Ventures)	- Editorial aspects of PDD - Baseline study and additionality - Details of emissions reduction calculation

A detailed list including the functions or designations of the interviewed persons is given in chapter 6 (see. Table 6-4). This table also includes reference codes to be used in the validation protocol.

3.5 Resolution of Clarification and Corrective Action Requests

In order to remedy any mistakes, problems or any other outstanding issues, which needed to be clarified for positive conclusion on the project design, CARs and CRs can be raised.

For this validation no CARs and CRs were raised.

However if CARs / CRs would have been raised then these would have been documented in Annex and addressed in section 4.

3.6 Finalising the report

As zero CARs / CRs have arisen during validation, requiring revision in the project design document, TÜV NORD JI/CDM CP issues this final validation report and opinion.

4 VALIDATION FINDINGS

In the following paragraphs the findings from the desk review of the draft PDD^{/PDD1/}, visits, interviews and supporting documents are summarised. This also includes the corresponding corrective action taken by the client and its final assessment.

The results are shown in table 4-1:

Table 4-1: Summary of CAR and CR issued

Validation topic ¹⁾	No. of CAR	No. of CR
Criterion 1 - Project Category	0	0
Criterion 2 - Geographic Location	0	0
Criterion 3 - Eligible GHGs	0	0
Criterion 4 - Project Start Date	0	0
Criterion 5 - Emission Reduction Start Date	0	0
Criterion 6 - Public Funding and grants	0	0
Criterion 7 - Project Boundary/GHG Assessment Boundary	0	0
Criterion 8 - Calculation Methodology	0	0
Criterion 9 – Secondary Effects	0	0
Criterion 10 - Project Additionality	0	0
Criterion 11 - Quality of Reductions	0	0
Criterion 12 - Monitoring Process	0	0
SUM	0	0

¹⁾ The letters in brackets refer to the validation protocol

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 2).

5 VALIDATION OPINION

Project Title	86 MW Hydro Project in Himachal Pradesh
Name of Project Participant	M/s. Malana Power Company Limited (MPCL)
Submitted PDD	Version 2: 86 MW Hydro Project in Himachal Pradesh (dated 25/12/2007)
Approved CDM Methodology used for Validation	ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 06 date: 19/05/2006)
Scope of Validation	The scope of this engagement covers the validation of voluntary Greenhouse Gas emission reductions generated by the above-mentioned project activity for first renewable crediting period. The validation is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on Approved methodology ACM0002 / Version 06, Sectoral Scope: 1, 19/05/2006, Consolidated baseline methodology for grid-connected electricity generation from renewable sources, which are included in the PDD ^{PDD/} and other relevant supporting documents.
Validation Opinion	TÜV NORD JI/CDM Certification Program has validated the project activity as per the relevant requirements of the VCS- version-I and CDM rule frame of UNFCCC applicable for VER project activities, as well as criteria for consistent project operations, monitoring and reporting. The review of the PDD and additional documents related to baseline and monitoring methodology; the subsequent background investigation to validate the fulfilment of the stated criteria of the VCS- version-I. The validation is based on the revised Project Design Document (PDD) (25th December 2006 Version-2), emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant. As a result of the validation, the validation team confirms that: • All operations of the project are implemented and installed as planned and described in the validated project design document. • The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions can be achieved within the 10 years (fixed) crediting period. • The monitoring system is in place and functional. The project is ready to generate GHG emission reductions. • The project additionality is sufficiently justified in the PDD. • The monitoring plan is transparent and adequate. As the result of the validation, the validator confirms that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.
Baseline Emissions over the verification period	2,605,584 t CO _{2eq}
Leakage	0 t CO _{2eq}
Project Emissions	0 t CO _{2eq}
Total Emission Reduction Verified over verification period	2,605,584 t CO _{2eq}

Mumbai, 2007-04-25



Asim K. Jana
TÜV NORD JI/CDM Certification Program
Validation Team Leader

6 REFERENCES

Table 6-1: Documents provided by the project proponent

Reference	Document
/PDD/	Project Design Document entitled "86 MW Hydro Project in Himachal Pradesh", version 2, dated 25-12-2006
/JMR/	Monthly Power Generation Reports for the duration July 2001- March 2007
/SD/	Proof of starting date of the project activity : 5 th July 2001, Extract of the Annual report 2001-2002
/XCS/	Baseline and Emission Reduction Calculations (Excel Sheets)

Table 6-2: Background investigation and assessment documents

Reference	Document
/ACM 0002/	Consolidated methodology for grid-connected electricity generation from renewable sources (version 06: 19 May 2006)
/CBD/	CO ₂ Baseline Database for Indian Power Sector –User Guide, Ver 1.1 dated Dec'06 published by CEA
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/GCP/	UNFCCC: Guidelines for completing CDM-PDD and CDM-NM (Version 05)
/GEF/	Official data sources for Grid Emission Factor (Regional Grid, 04-05)
/IPCC-GP/	IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2006
/IPPC-RM/	1. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual 2. IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2006
/KPI/	Kyoto Protocol (1997)
/MA/	Decision 17/CP. 7 (Marrakesh – Accords and Annex to decision 17/CP.7)
/TN- VOS/	TUV Nord JI/CDM CP voluntary off-set standard.

Reference	Document
/VVM/	IETA, PCF Validation and Verification Manual (V. 4)
/VCS/	The voluntary carbon standard, verification protocol and criteria, version 01

Table 6-3: Websites used

Reference	Link	Organisation
/cea/	www.cea.nic.in	Central Electricity Authority
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/ufccc/	http://cdm.unfccc.int	UNFCCC
/ieta/	http://www.ieta.org/	Website of International Emission trading Association (IETA)
/mop/	http://www.powermin.nic.in/	Website of Ministry of Power, Government of India
/ghg/	http://www.ghgprotocol.org/templates/GHG5/layout.asp?MenuID=849	World Business Council for Sustainable Development

Table 6-4: List of interviewed persons

Reference	Moi ¹		Name	Organisation / Function
/IM01/	T	☒ Mr. ☐ Ms	O P Ajmera	Malana Power Company Limited- Vice-President & CFO
/IM02/	V	☐ Mr. ☒ Ms.	Harshpreet Singh	Emergent Ventures India Private Limited.

¹⁾ Means of Interview: Telephone (T), E-Mail (E), Visit (V)

ANNEX

Validation Protocol

Table 1: Validation/ Verification Minimum Criterion Checklist*(customized based on VCS version 01³ and the applicable CDM criterion⁴ at the time of PDD/MR submission)*

Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
1	Project Category	Criterion: Emission reduction project types eligible under the VCU Verification Criteria are listed below, divided into categories for the benefit of project developers and certification entities: 1. Renewable energy [wind, PV, solar thermal, biomass, liquid biofuels, geothermal, run-of-river hydro] 2. Industrial energy efficiency 3. End-use energy efficiency 4. Fuel switch from fossil to fossil or non-agricultural waste gas 5. Waste gas capture and destruction (recovery) from non-agricultural industrial processes (N₂O, HFCs, PFCs, SF₆) 6. Waste gas capture from municipal waste and municipal wastewater treatment (CH₄ & N₂O) 7. Fugitive emissions capture/recovery 8. LULUCF DOE's Action: Verification Entity shall verify that the Project directly avoids or displaces greenhouse gas emissions from an Endorsed Project Category and shall clearly state in the Verification Report which project category the reduction belongs to.					
	1.1	Is the eligibility of the project category and the discussion and determination of the project category transparent?	/PDD/ A.2	DR	The project qualifies the criteria of emission reduction project under VCU verification criteria. It qualifies the first category "Renewable energy [run-of river hydro]" as per section 3, page number 10 of VCS verification criteria.	OK	

³ www.ieta.org⁴ http://cdm.unfccc.int



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
	1.2	Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/PDD/ D.4	DR, I	Yes, the PDD section describes that the monitoring is being carried out by a competent CDM project team. This is also verified during the site interview.	OK	
	1.3	Does the project consist of several sub Project Activities which meet the VCS Verification Criteria?	/PDD/ /VCS- I/ /cea/	DR, I	The project does not comprise of several sub-bundles and is a run-of-river hydel project comprising of 2 x 43 MW turbines. There is no double counting of emission reductions.	OK	
2	Geographic Location	Criterion: <i>The VCU Verification Criteria recognizes projects from any geographic location.</i> DOE's Action: <i>Verification Entity shall verify, through site visits, that at the stated geographic location there are working physical components, installed facility and emission reduction monitoring equipment corresponding to the actual Project disclosed in the project documents made available to the Verification Entity.</i> <i>In the Verification Report, the Verification Entity shall include documented evidence of a site visit confirming existence of the stated Project at the stated location.</i>					
	2.1	Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/PDD/	DR, I	Yes, the projects system boundaries are explained under section B.4 of the PDD. This has also been verified during onsite interview.	OK	



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
3	Eligible GHGs	Criterion: The VCU Verification Criteria acknowledges emission reduction projects involving any of the six greenhouse gases currently included in the Kyoto Protocol. DOE's Action: Verification Entity shall verify that the Project Activity contributes to reductions in the emissions of one or more of the following six Kyoto Protocol greenhouse gases: 1. Carbon dioxide (CO₂); 2. Methane (CH₄); 3. Nitrous oxide (N₂O); 4. Hydrofluorocarbons (HFCs); 5. Perfluorocarbons (PFCs); 6. Sulphur hexafluoride (SF₆). In the Verification Report, the Verification Entity shall state the volume of emission reductions for each of the six greenhouse gases separately. The Verification Entity shall further verify and state that the current IPCC published GWP factor has been used for non-CO₂ gases.					
	3.1	Does the PDD provide for the calculation of all GHG's necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/PDD/ /ACM0002/	DR	Yes, the power exported from this hydel power project activity displaces the power from the northern grid. Accordingly the calculation of GHG's(CO ₂) necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period, has been described in the PDD. There are no project GHG emissions.	OK	
	3.2	Are all relevant GHG considered for the project activity?	/PDD/	DR	Yes, the CO ₂ as only GHG have been chosen as per ACM0002.	OK	
	3.3	Will it be possible to estimate / measure the specified project GHG indicators?	/PDD/	DR	Yes, it is possible with the data being monitored.	OK	



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4	Project Start Date	Criterion: The VCU Verification Criteria acknowledges emission reduction projects that have started on or after January 1st, 2000. DOE's Action: Entity shall verify, through examination of company documents and records that the Start Date of the Project which generated the emission reductions was on or after January 1st 2000. Verification Entity shall also verify that completion of installation works does not contradict with the dates of generation of emission reductions in the monitoring report.					
	4.1	Are the project's starting date and operational lifetime clearly defined and reasonable?	/PDD/ C.1.1	DR	The project's start date is after January 1 st 2000 ^{/SD/} .	OK	
5	Emission Reduction Start Date	Criterion: The VCU Verification Criteria acknowledges emission reductions which have been generated after January 1, 2000. The Standard acknowledges only existing emission reductions, i.e. reductions that have already happened DOE's Action: Verification Entity shall verify, through examination of company documents, records, and monitoring reports that the emission reductions occurred on or after January 1, 2000. In the Verification Report, the Verification Entity shall clearly state the volume of emission reductions generated in each calendar year separately.					
	5.1	Are the starting dates of the project activity and emission reduction date due	/PDD/	DR	The starting date of the project activity is 5 th July 2001 ^{/SD/} when the	OK	



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
		to installation of project are clearly defined?	C.2.2.2		project started hydro power generation.		
6	Public Funding and grants	Criterion: <i>The VCU Verification Criteria only accept projects where no public funding or official development assistance has been employed in the project activity or those elements of the project activity that lead to emissions reductions. Where public funding has been used in conjunction with commercial financing, only emissions reductions associated with that portion of the project that has been financed on purely commercial terms shall be eligible to be certified as VCUs.</i> DOE's Action: <i>Verification Entity shall verify and state in the Verification Report that the Project has not employed any Public Funding, grants or Official Development Assistance ("ODA") for construction or running operations in any of the geographic locations of the Project Activity.</i> <i>Where a combination of public and private funding has been employed the Verification Entity shall verify and state in the Verification report that VCUs have only been generated from that portion of the project that has been financed on purely commercial terms.</i> <i>Verification should be performed through examination of financial records, management interviews, and where necessary, interviews with representatives of the relevant entities or organizations providing development assistance in the respective project locations.</i>					
	6.1	Does the project any public funding, grants or official development assistance ("ODA") for construction or running operations in any of the geographic locations of the project activity?	/PDD/ Annex -2	DR	No, as per annex-2 of PDD the project does not involve any public funding, grants or official development funds.	OK	



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7	Project Boundary/ GHG Assessment Boundary	Criterion: <i>The VCU Verification Criteria require that the project boundary shall encompass all anthropogenic emissions by sources of greenhouse gases (GHG) under the control of the project participants that are significant and reasonably attributable to the project activity.</i> DOE's Action: <i>Verification Entity shall verify and state in the Verification Report that the project boundary and GHG Assessment Boundary incorporates all primary effects and significant Secondary Effects, and that the requirements for defining the GHG assessment boundary (as defined in the GHG-PP) have been met.</i> <i>Verification Entity shall also make sure that the Project Boundary does not indirectly overlap with up- or downstream facilities. In particular, Verification Entity shall disallow any downstream energy efficiency projects in jurisdictions which have mandatory GHG emission caps on the electricity sector.</i>					
	7.1	Are the project's spatial (geographical) boundaries clearly defined?	/PDD/ A.4.1. 4	DR	The spatial boundaries are well defined in PDD.	OK	
	7.2	Does the project boundary and GHG Assessment Boundary incorporate all primary effects and significant secondary effects, as per the requirements for defining the GHG assessment boundary (as defined in the GHG-PP)?	/PDD/	DR	Yes, the project boundary and GHG Assessment Boundary incorporate all primary effects and significant secondary effects, as per the requirements for defining the GHG assessment boundary.	OK	
	7.3	Is only one project boundary defined for all Project Activities in order to avoid double counting? (As per GHG Assessment Boundary is defined in Sec	/PDD/	DR	The project boundary is defined.	OK	



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		2.5 and Chapter 5 of the GHG-PP, available at; http://www.ghgprotocol.org/plugins/GHGD/OC/details.asp?type=DocDet&ObjectId=MTc0MTg and ISO14064)?					
	7.4	Does the PDD include all GHG's (direct and indirect) necessary for estimation or measuring the greenhouse gas emissions during the crediting period?	/PDD/	DR	The project activity is a run-of-river hydel power project and there are no direct or indirect emissions from the project activity. Electricity generated by the project is the key monitoring parameter for emission reduction calculation.	OK	
8.	Calculation Methodology	Criterion: The VCU Verification Criteria requires that: A. Where possible, the project proponents shall use calculation methodologies that have been approved by the CDM Executive Board for determining emission reductions for the specific Project type. Where an existing approved calculation methodology is not applicable in its entirety, project proponents may use combinations of approved methodologies. B. In situations where an existing CDM Executive Board methodology is not available in its entirety or as a combination of existing approved methodologies, the project proponent shall clearly illustrate how the Project baseline was identified and emission reductions calculated. The proponent may use a performance standard or best practice approaches to determine the baseline emissions and calculating the emissions reductions, as described in the GHG -PP. DOE's Action: A. Verification Entity shall verify and state in the Verification Report, if applicable, that the project proponent has used calculation methodologies that have been approved by the CDM Executive Board for estimating the volume of emissions reductions generated from the Project.					

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		<i>and that those methodologies have been correctly and accurately applied in calculating the total emissions reductions generated by the respective Project. This includes, but is not limited to, stating in the Verification Report the following:</i> • Identification of Baseline Candidates; • Determination of a Baseline Scenario; • Definition and calculation of Baseline Emissions; • Definition and calculation of project emissions; and • Calculation of project emission reductions. <i>In case the project has earlier been verified for delivery of VCUs, the Verification Entity shall point out differences in the baseline between the current and any earlier verifications. The baseline shall not remain fixed between two verification periods</i> <i>In such cases where the Calculation Methodology consists of a combination of approved methodologies, the Verification Entity shall clearly verify:</i> • which approved methodologies have been used ;and, • methodologies have been used accurately and transparently in combination. <i>B. If a CDM Executive Board approved methodology has not been used the Verification Entity shall verify and state in the Verification Report that the Project Activity has applied a methodology equivalent to the approved CDM methodology</i> <i>Verification Entity shall then verify and state in the Verification Report that the requirements, as defined by the GHG PP for the following criteria have been met:</i> • It uses the Performance Standard approach to calculate the baseline emissions in the absence of the project activity; • All the appropriate Baseline Candidates have been identified and their GHG emissions rates drawn from public references; • An appropriate Stringency Level has been selected for the performance standard; • All Primary and Significant Secondary Effects have					



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
		<i>been incorporated into the project's GHG Assessment Boundary (see secondary effects criterion below);</i> • <i>The calculation of emission reductions is accurate and fairly stated.</i>					
	8.1	Are the GHG calculations documented in a complete and transparent manner? Have conservative assumptions been used to calculate project GHG emissions?	/PDD/ /cea/	DR	Yes, the default values are used from the CEA data, version 1.1 published on 21/12/2006.	OK	
	8.2	Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/PDD/ /cea/	DR	There are no uncertainties associated with the estimation of project GHG emissions, as the default values are taken from the CEA data.	OK	
	8.3	Are potential secondary effects beyond the chosen project boundaries properly identified?	/PDD/ /ACM0 002/ /VCS- 1/	DR	As the project is run-of-river hydel power project, there are no secondary effects.	OK	
	8.4	Have these secondary effects been properly accounted and in conservative manner for calculations?	/PDD/ /VCS- 1/	DR	Please refer the comments made under 8.1 and 8.3.	OK	
	8.5	Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/PDD/ (D.2.1. 4, Section E)	DR	PDD gives the most relevant and likely operational characteristics, methodological choices and equations used for calculating baseline.	OK	
	8.6	Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/PDD/	DR	Yes, the baseline boundary is clearly defined as those covering the power generating stations connected to the northern grid.	OK	



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9	Secondary Effects	Criterion: The VCU Verification Criteria require that secondary effects be incorporated into the calculation methodology in accordance with the WBCSD GHG PP. DOE's Action: Verification Entity shall verify and state in the Verification Report that the project's GHG Assessment Boundary is in compliance with the ones indicated in the project documents. Verification Entity shall verify and state in the Verification Report that the GHG Assessment Boundary incorporates all primary effects and significant Secondary Effects.					
	9.1	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining secondary effects?	/PDD/ /ACM0 002/ /VCS- 1/	DR	Yes. Also refer to comments made in 8.1 and 8.4	OK	
	9.2	Are the secondary effects covered as defined by the WBCSD GHG Project Protocol (Sec 2.4) as unintended changes caused by the project activity in GHG emissions associated with a GHG Source?	/PDD/ /ACM0 002/ /VCS- 1/	DR	Please refer to comments made in 8.4	OK	
	9.3	Are GHG Assessment Boundary includes all Primary Effects and significant Secondary Effects associated with the GHG project (GHG PP Sec 25).	/PDD/ /ACM0 002/ /VCS- 1/	DR	Please refer to comments made in 8.6	OK	
10	Project Additionalit	Criterion: The VCU Verification Criteria requires that the projects from which emission reductions are created pass an additionality test. Through the Additionality Test the					



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
	y	<i>project proponent shall show that mitigation measures result in a real reduction in greenhouse gases against a transparent emissions baseline. Project additionality shall be determined based on one of the four (A-D) additionality tests described herein.</i> DOE's Action: A. Verification Entity shall verify and state in the Verification Report that there is clear evidence that each of the following three requirements of the Additionality Test have been met by the project. <u>1. The project is not common practice.</u> • Provision of underlying service or product with the project technology does not exceed 51% in the defined market area. • Business-as-usual technology options are clearly defined and their position on the market proven by official Statistics. <u>2. The project is not required by regulation</u> • Local or National Legislation does not require the production of the underlying service or product with the chosen technology. • Additionally, the Project should not have been undertaken to meet a formal or voluntary target imposed by government regulation or under agreement with a government agency (e.g. the auto manufacturers and the EU, where companies agree to meet reduction targets voluntarily through their industry association). • Carbon credits should not be the byproduct from the creation of an ancillary environmental asset and/or financial instrument (e.g. renewable energy credits). • The emission reductions from the Project must not have been used against any voluntary corporate emission reduction targets. • Project is not a downstream energy efficiency project in a jurisdiction with a mandatory GHG emissions cap on upstream electricity generators. <u>3. The project is not the least cost option for providing the underlying product or service.</u> • Companies shall provide calculations that illustrate that the project is not the Least Cost Option. B. Verification Entity shall verify and state in the					



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
		Verification Report that there is clear evidence that: • Using the steps in the CDM Additionality tool the project has been undertaken to reduce greenhouse gas emissions beyond normal business practice. C. Verification Entity shall verify and state in the Verification Report that there is clear evidence that: • In addition to a satisfactory project baseline, the project falls within the top quintile (20%) in terms of emissions efficiency for producing the underlying service or product in the region/country. D. Verification Entity shall verify and state in the Verification Report that there is clear evidence that a project is additional because: • the project has selected the appropriate baseline and its project emissions are found to be below the selected baseline. In order to determine the baseline the project will use either of the following three determination methods: - Determine the baseline based on existing or historical emissions - Determine the baseline based on its industry benchmark under similar social, economic, environmental and technological circumstances - Determine the baseline by identifying the most likely new project activity providing the same level of services as the proposed project.					
	10.1	Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/PDD/ /ACM0 002/	DR	Historically grid was the source of the electric power. Moreover, the project activity is a 1st of its kind hydro power project in the private sector.	OK	
	10.2	Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (examples: through	/PDD/ /ACM0	DR	Yes this is well justified in the PDD using the additionality test stated in VCS-Criteria 10- option D.	OK	



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
		demonstrating investment barriers, technology barriers, barriers to prevailing practices, and/or other barriers or through quantitative evidence that the project would otherwise not be implemented)?	002/ /ADD/				
	10.3	Have the major risks to the baseline been identified?	/PDD/ /ACM0 002/	DR	There is no major risk as data considered is from official source ^{/cea/} .	OK	
11	Quality of Reductions	Criterion: <i>The VCU Verification Criteria requires that projects proponents demonstrate that project implementation has no negative impact on sustainable development in the local community.</i> DOE's Action: <i>Verification Entity shall verify and state in the Verification Report a project's design and implementation has been carried out in compliance with all relevant local and national environmental and social legislation in the host country.</i>					
	11.1	Does the project comply with environmental legislation in the host country?	/PDD/ (Section F)	DR	Yes	OK	
	11.2	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/PDD/ (Section F)	DR	The project proponent has carried out an EIA as mandated under law. The environmental impacts are managed thorough a comprehensive Environmental Management Programme (EMP).	OK	
	11.3	Are all the negative impacts highlighted with reference to intensity or magnitude of the problem sufficiently discussed?	/PDD/ (Section F)	DR	As the project is run-of-river hydel power project. The project impact has been adequately discussed in PDD and addressed thorough an EIA.	OK	



Step #	Criterion/ checklist points	Description of Minimum Criterion and Actions for DOE	Ref.	MoV*	Comments of DOE	Draft Concl.	Final Concl.
	11.4	Have relevant stakeholders been consulted?	/PDD/ (Section G)	DR	The PDD elaborately describes the stakeholder consultation process and how it was sought. The comments received were addressed through satisfactory mutually agreed upon arrangements as described in PDD.	OK	
	11.5	Has due account been taken of any stakeholder comments received?	/PDD/ (Section G)	DR	Please refer comments under 11.4	OK	
12	Monitoring Process	Criterion: <i>The VCU Verification Criteria requires that for estimating a project's emission reductions the project proponent shall, to the extent possible, use the most recent emission reduction monitoring protocol that has been approved by the CDM Executive Board or the JI Supervisory Committee for that project type.</i> DOE's Action: <i>For reductions generated between January 1.2000 and the date of submission, the project proponent shall supply to the Verification Entity a complete Monitoring Report.</i> <i>Verification Entity shall assess the proposed greenhouse gas data management, control and reporting systems, e.g. instructions, procedures, record keeping systems, assumptions, technical equations, models and other means that support complete, accurate, and conservative VCU estimates. Verification Entity shall verify and state in the Verification Report that the project proponent has either (1) used the most recent emission reduction monitoring protocol approved by the CDM Executive Board or JI Supervisory Committee for the project type if available; or if not available has (2) employed monitoring procedures support complete, accurate, and conservative VCU estimates.</i>					



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	12.1	Is the monitoring methodology applicable for this project and is it previously approved by the CDM/ JI Methodology/ VCS Steering committee Panel?	/PDD/ /ACM0002/	DR	Yes, the project applies ACM0002 / Revision to the approved consolidated baseline methodology ACM0002 Version 06: 19/05/2006, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". This is justified in Section D.2 of PDD.	OK	
	12.2	Has the PDD form been duly filled?	/PDD/	DR	Yes	OK	
	12.3	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary?	/PDD/ /ACM0002/	DR	Yes, monitoring plan provides for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions like the total units of electricity exported to grid and data of grid emission factor.	OK	
	12.4	Will it be possible to monitor / measure the specified project GHG indicators?	/PDD/ /ACM0002/	DR	Yes	OK	
	12.5	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/PDD/ /ACM0002/	DR	Please refer comments under 12.3	OK	
	12.6	Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/PDD/ /cea/	DR	Yes, the choice of baseline emission indicator CO ₂ is reasonable.	OK	



Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarification requests and corrective action requests by validation team	Reference to checklist step # from table no 1	Summary of project owner response	Validation team conclusion
Corrective Action Requests (CARs)			
Nil			
Clarification Requests (CRs)			
Nil			