Voluntary Carbon Standard
Project Description

19 November 2007

[30 March, 2010]

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Abbreviations:

A
Approved methodologies for small-scale (AMS) CDM project activities

B
Build Margin (BM)

C
Central Electricity Authority (CEA)
Combined Margin (CM)

D
Detailed Project Report (DPR)

E
Electro - Mechanical (E & M)
Emission Factor (EF)
Emission Reduction (ER)
Environmental Impact Assessment (EIA)

G
Greenhouse Gases (GHGs)

H
Harisons Hydel Construction Co. (P) Limited (HHCCPL)
Himachal Pradesh State Electricity Board (HPSEB)
Himachal Pradesh State Environment Protection & Pollution Control Board (EPPCB)

I
Internal Rate of Return (IRR)

J
Joint Meter Reading (JMR)

N
Northern Eastern Western North – Eastern (NEWNE)

O
Operating Margin (OM)

P
Project Design Document (PDD)

R
Rehabilitation & Resettlement (R & R)
Renewable Energy Certificates (REC)

V
Voluntary Carbon Standard (VCS)

1 Description of Project:

1.1 Project title

"5 MW Brahm Ganga Hydro – Electric Project" at Kullu district of Himachal Pradesh, India.

1.2 Type/Category of the project

The project activity comes under the following category as per the Voluntary Carbon Standard (VCS) -2007.1[1]

Project Type : Sectoral Scope 1 (Energy industries: Renewable/ Non-Renewable sources)

Project Category : AMS I.D, Version 15, valid from 30th October, 2009[2].

The project activity is not grouped or de bundled component of any other project activity.

1.3 Estimated amount of emission reductions over the crediting period including project size:

The project will result into the amount of emission reduction of 17, 868 tCO_2 per year and therefore, falls in-between the micro and mega project categories as per VCS 2007.1 guidelines[3].

Annual Estimation of Emission Reductions over the crediting period

Years	Estimation of annual emission reductions in tonnes of CO_2e
2008*- 2009	17, 868
2009 – 2010	17, 868
2010 – 2011	17, 868
2011- 2012	17, 868
2012 – 2013	17, 868
2013 – 2014	17, 868

1 Voluntary Carbon Standard 2007.1; Page no. – 8; please refer to - 3 VCS Program specific issues; 3.1 Scope of the VCS Program; "project category (ies) which is part of an approved GHG Program"

2 http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9

3 Voluntary Carbon Standard 2007.1; Page no. – 7; please refer to Mega projects & Micro project

2014 – 2015	17, 868
2015 – 2016	17, 868
2016 – 2017	17, 868
2017- 2018	17, 868
Total estimated reductions (tonnes of CO_2e)	178, 680
Total number of crediting years	10 Years
Annual average of the estimated reductions over the crediting period (tCO_2e)	17, 868

* 1st April – 31st March every year

1.4 A brief description of the project:

The project activity involves implementation and operation of a 5 MW (2 × 2.5 MW) small scale, grid connected, run-of-the-river Hydro-electric project (HEP), located on the Brahm Ganga Nallah (Tributary of River Parbati) in Kullu District of Himachal Pradesh, India. The purpose of the project is to generate clean energy in a sustainable manner, utilizing hydrological resource of the Nallah.

The project activity supplies electricity to the respective State Grid of India, which is highly dominated by thermal based power generating units.

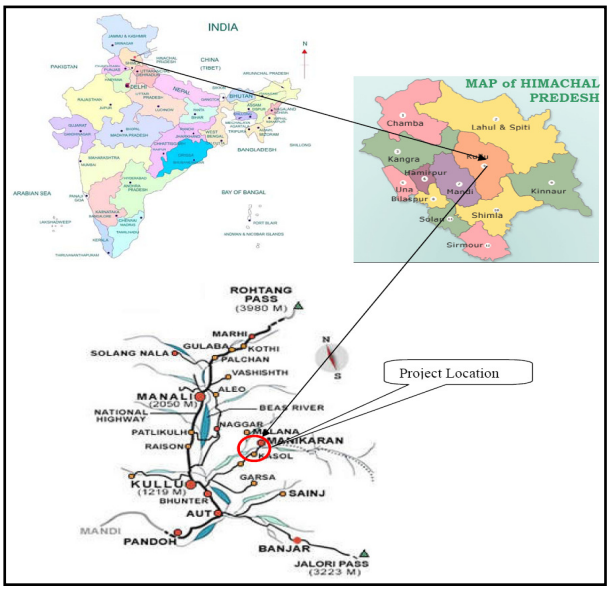
In context of the ever-increasing demand of electricity, the implementation of the project contributes to help in meeting the power demand- supply gap in the Northern grid of India, which is a part of the integrated Grid system, i.e. NEWNE Grid [4] . Also, through utilization of the hydro potential, the project activity is displacing the same amount of electricity generated from fossil fuel based power generating units from the grid, thereby, contributing towards the reduction of Greenhouse Gas emissions (GHGs) from the atmosphere.

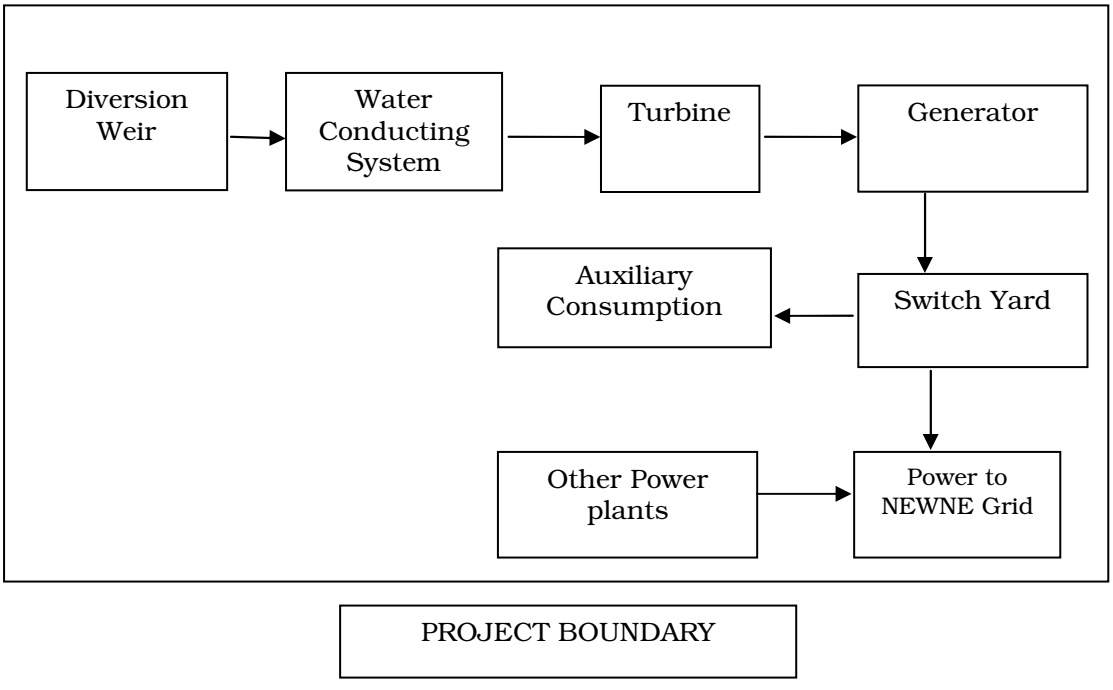
The project consists of two 2.5 MW Horizontal axis Francis turbines, with an expected net electricity supply of 21, 270 MWh per annum, as per the Detailed Project Report (DPR) prepared by Dr. Hutarew & Partner (I) Pvt. Ltd., third party appointed by the project proponent, which is in line with the EB 48, Annex 11.

[4] CO_2 Baseline Database for the Indian Power Sector, User Guide, Version 5.0; page 4; Table 2; http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

1.5 Project location including geographic and physical information allowing the unique identification and delineation of the specific extent of the project:

The 5 MW (2 × 2.5 MW) Hydro Electric Power Project is located near the Manikaran village on the right bank of the Brahm Ganga Nallah in District Kullu of Himachal Pradesh. The project area is approached by the motorable road of 45 km from Kullu and 70 km from the Manali town. The nearest railway station is Chandigarh, which is located about 275 km[5] on Delhi-Kalka trunk line. The nearest airport is at Bhuntar. The project area is located between Latitude 32º 02' N and Longitude 77º 21.20' E. The physical location of the project has been shown as follows:





[5] Source: Detailed Project Report

1.6 Duration of the project activity/crediting period:

Project Start Date	**:** 2nd April, 2008 (Project Commissioning date)[6] as per the Commissioning certificate.
Crediting Period Start Date	: A renewable crediting period of 10 years has been chosen. The start date of the crediting period will be 2nd April, 2008[7].

1.7 Conditions prior to project initiation:

The project activity is located in the state of Himachal Pradesh of India. Therefore, the amount of electricity generated from the project will be supplied to the Northern grid which comes under the Integrated grid system[8] i.e. NEWNE Grid. The Northern grid is highly dominated by the thermal based power generating units accounting to 60.97%[9]. In the absence of the project activity, the amount of electricity supplied to the grid would have been generated by the operation of grid connected, fossil-fuel based thermal power generation sources.

The project thus displaces the thermal based power generation and reduces associated emissions from the respective grid of India.

1.8 A description of how the project will achieve GHG emission reductions and/or removal enhancements:

The project activity utilizes the available hydro power potential of the Brahm Ganga Nallah which is a tributary of river Parbati to generate electricity in a sustainable manner. Being a small scale hydro, the project activity supplies the amount of electricity generated to the NEWNE grid, which is highly dominated by the fossil fuel fired generating units.

The project activity thereby replaces an equivalent amount of electricity generation from the fossil fuel-fired power plants connected to the NEWNE Grid system, hence will reduce the emission of greenhouse gases (GHGs) from the atmosphere. From the publicly available data base on emission factor published by Central Electricity Authority (CEA), Government of India, the emission reduction can be estimated using the net amount of electricity supply from the project

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[6] http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007_1.pdf. As per the Voluntary Carbon Standard 2007.1, page no: 7 "the Project Start Date is the Date on which the project began reducing or removing GHG emissions."

[7] http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007_1.pdf.; Voluntary Carbon Standard 2007.1; page no: 7; Project Crediting period and project crediting period start date

[8] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm; CO2 Baseline Database for the Indian Power Sector; User Guide, Version 5.0, November 2009; page no. 4; table 2

[9] http://www.cea.nic.in/about_us/Annual Report/2004-05/Contents.htm; please refer Annexure- 11-B, page no. 7

activity multiplied with the emission factor values of the respective grid system.

1.9 Project technologies, products, services and the expected level of activity:

The project activity is a run-of-the-river hydro electric power generating plant. The diversion of water of Brahm Ganga Nallah is done by construction of a diversion weir. The amount of water diverted is taken to the power house through water conduction system comprising of power tunnel. The electricity is generated by converting potential energy (available due to net head of 229.3 m) into kinetic energy through two (2 x 2.5 MW) Horizontal Axis Francis Turbines and is then coupled with generators to further convert this kinetic energy (mechanical energy) into electrical energy. The detailed description of the project components have been described below:

1. Diversion Structure:

    a. Type of Structure : Boulder Type wire
    b. Length : 24 meters
    c. Number of Gates : 2 nos. at inlet and one nos. at bottom outlet

2. Water Conductor System:

    a. Intake and Approach channel:
        i. Length :5 meters
        ii. Size :3m X 3.5m
    b. Desilting Tank:
        i. Type : Dufour Type
        ii. Dimension : 45m X 8m X 3.5m
    c. Power Tunnel :
        i. Shape : D-shaped tunnel
        ii. Length : 996 meters
        iii. Dimension : 996m X 2m X 2.4m

3. Fore bay :
    a. Size : 15m X 8m
    b. Maximum Discharge Capacity : 2.52 cumecs

4. Penstock:
    a. Number : 01
    b. Length : 330 meters
    c. Diameter : 1000 mm dia

5. Power House:
    a. Type : Surface
    b. Dimension : 24.95m X 9.5m X 11.2m

c. Turbines : 2 No.s of 2500 kW capacity each, Horizontal Axis Francis

d. Generator : Synchronous, Brushless type

6. Tail Race Tunnel:

a. Length : 50 meters

b. Shape : Two rectangular RCC ducts emanating from each unit & merging together in a rectangular open channel

Two step up transformers (one for each machine) have been used to step up voltage to 33 KV. This 33 kV electricity is transmitted to the Himachal Pradesh State Electricity Board (HPSEB) sub-station at Jari.

1.10 Compliance with relevant local laws and regulations related to the project:

The project activity is in compliance with relevant local laws and regulations related to the project and have also considered all the mandatory & applicable legal and regulatory requirements[10].

Various Clearances/ Approvals from the respective State Regulatory bodies have been shown below:

Regulatory Bodies	**Roles**	**Description of Involvement**
Himachal Pradesh State Environment Protection & Pollution Control Board (EPSEP&PCB)	A statutory body that oversees the pollution control aspects in the state. Any project activity shall obtain clearance from the state EPPCB before implementation.	'Consent for Establishment' under Water Act, 1974 and Air Act, 1981.
Department of Irrigation, Government of Himachal Pradesh	Government Body for giving approval for utilization of water.	Has issued Clearance for utilizing water resources in Himachal Pradesh state.
Ministry of Environment & Forests, Government of India	Government body responsible for supervision of utilization of forest land.	Has issued Forest Clearance for utilizing forest land for construction of project
Directorate of Fisheries,	Regulatory body responsible for issuing No	Has issued No Objection Certificate

[10] http://envfor.nic.in/legis/eia/eia-2006.htm; S.O.1533(E),[14/09/06] - Environmental Impact Assessment Notification, 2006

Regulatory Bodies	Roles	Description of Involvement
Department of Fisheries, Himachal Pradesh	Objection Certificate (NOC) for disposal of silt and maintenance of environmental flow of water.	(NOC)

1.11 Identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements:

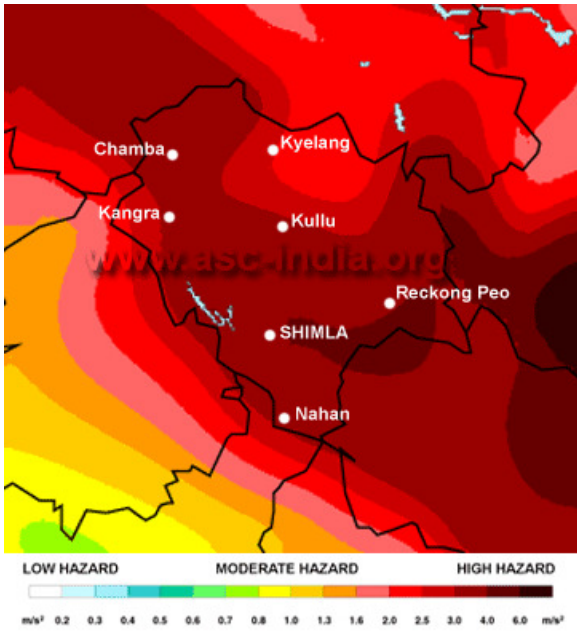
The project activity faces major geological risk which has been discussed in the following paragraphs:

Geological Risk

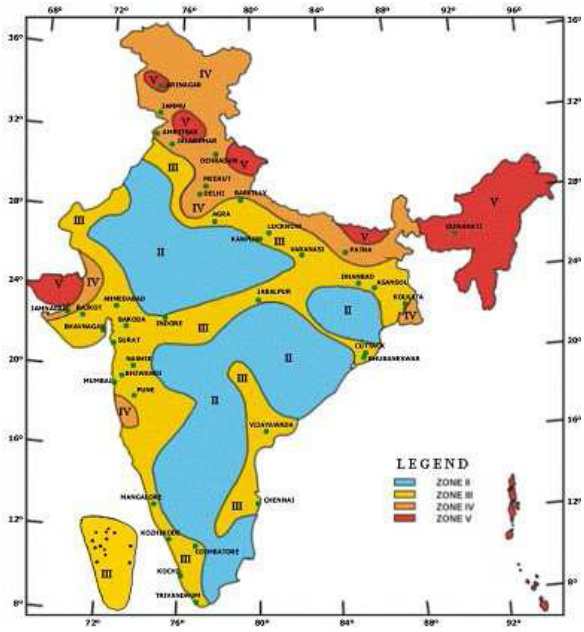
The state of Himachal Pradesh is exposed to various geological risks. Frequent natural disasters like Earthquakes, landslides, cloudbursts and flash floods of various intensities and their impact have caused tremendous loss to the state of Himachal Pradesh. The project site being located at the Manikaran Valley of Kullu district of Himachal Pradesh, is prone to such natural disasters which causes threat to the construction and implementation of the project.

The project area lies in Himalayan geology with number of thrusts and faults. It is seen from the following seismic zoning map of India that the project area lies within seismic zone V[11] which denotes as a high seismic intensity region in India.

[11] http://asc-india.org/maps/hazard/haz-himachal-pradesh.htm



Seismic Map of India



Seismic hazard map of Himachal Pradesh

Thus, the possibility of frequent geological hazards cannot be ruled out in this area which may impose severe obstructions. Major earthquakes occurred in the past have been shown below:

Major Earthquake	Date of Occurrence	Magnitude (in Richter scale)
Kangra	April 04, 1905	8.0
Kinnaur	January 19, 1975	6.2
Dharamshala	April 26, 1986	5.5

Few major earthquakes have also occurred in the project area in the past [12]. The project has also experienced cloud burst during the construction of the project which caused substantial loss to the project resulting in the increase in project cost.

Therefore, there is always a possibility of the occurrence of such natural disasters which can substantially damage the overall project set up and make an impact on the power generation, thus affecting the GHG reductions.

[12] http://asc-india.org/seismi/seis-himachal-pradesh.htm & http://www.iisc.ernet.in/currsci/oct102004/863.pdf

1.12 Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

Being a new, small scale, run-of-the-river renewable energy (hydro) based power project, the project activity will not be responsible for any emission [13] and will contribute towards reduction of the GHG emissions from the grid to an appreciable level. Therefore, it can be concluded that the project is not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

1.13 Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

No such environmental credit or Renewable energy certificates (REC) has been created by the project activity. The project proponent has provided the declaration letter that the project has not created any environmental credits or Renewable energy certificates (REC). The copy of the declaration letter dated 21/01/2010 has been provided to the Designated Operational Entity (DOE).

1.14 Project rejected under other GHG programs (if applicable):

The project is not rejected under any GHG program. The project proponent has declared that the project has not been rejected under any other GHG program. The copy of the declaration letter dated 21/01/2010 has been provided to the Designated Operational Entity (DOE).

1.15 Project proponents roles and responsibilities, including contact information of the project proponent, other project participants:

Contact information of the Project Proponent:

Organization	Harisons Hydel Construction Co. (P) Limited (HHCCPL)[14]
Street/ P.O Box	Akhara Bazaar
Building	
City	Kullu
State/ Region	Himachal Pradesh
Postfix/ Zip	175101
Country	India
Telephone	+91 (0) 1902 225045

[13] http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9; page 6/9; Project emissions 14. & Leakage 15.

[14] The Project participant & no other project participant is associated with the project activity.

Fax	+91 (0) 1902 225045
E-mail	hhccpl_kullu@yahoo.co.in
Represented by	
Title	Director
Last name	Sood
Middle Name	
First Name	Ghanshyam
Mobile	+91 9816024893
Direct Fax	
Direct Tel	
Personal E-mail	

Harisons Hydel Construction Co. (P) Limited (HHCCPL) will be solely responsible for the execution and operation of the project, monitoring plan to estimate the emission reduction from the project activity. The necessary calibration of the measuring equipments for the electricity supplied will also be the responsibility of the project participant. Furthermore, they will manage the overall VCS project development, validation and verification.

1.16 Any information relevant for the eligibility of the project and quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental, geographic, site-specific and temporal information.):

Legislative

The following clearances/ approvals have been received from the respective State Regulatory Bodies:

Regulatory Bodies	**Roles**	**Description of Involvement**
Himachal Pradesh State Environment Protection & Pollution Control Board (EPSEP&PCB)	A statutory body that oversees the pollution control aspects in the state. Any project activity shall obtain clearance from the state EPPCB before implementation.	'Consent for Establishment' under Water Act, 1974 and Air Act, 1981.
Department of Irrigation, Government of Himachal Pradesh	Government Body for giving approval for utilization of water.	Has issued Clearance for utilizing water resources in Himachal Pradesh state.
Ministry of Environment & Forests,	Government body responsible for supervision of utilization of forest land.	Has issued Forest Clearance for utilizing forest land for

Regulatory Bodies	Roles	Description of Involvement
Government of India		construction of project
Directorate of Fisheries, Department of Fisheries, Himachal Pradesh	Regulatory body responsible for issuing No Objection Certificate (NOC) for disposal of silt and maintenance of environmental flow of water.	Has issued No Objection Certificate (NOC)

Social benefits:

- The project activity has facilitated development and access of infrastructures in the area, which has substantial impact in enhancing various livelihood options for the villagers.

Economic benefits:

- The project activity has generated both direct and indirect employment opportunities for the local population during both the operational and construction phase.

Environmental benefits:

- The electricity generated from the project has replaced carbon intensive thermal based electricity generation inform the respective grid system, thus helps in addressing the demand - supply gap as well as reducing carbon intensity in form the power sector in a sustainable manner.

Technological benefits:

Safe and proven technology has been used.

Thus, the project activity is contributing towards the sustainable development criteria of the country.

1.17 List of commercially sensitive information (if applicable):

Not Applicable

2 VCS Methodology:

2.1 Title and reference of the VCS methodology applied to the project activity and explanation of methodology choices:

The project activity is a 5 MW (capacity ≤ 15 MW[15]) run-of the river, small scale hydro-electric project and supply electricity to the Northern Grid of India. Therefore, the baseline methodology selected for this project is

Methodology : Approved Methodology i.e. AMS-I.D./Version 15, approved in EB 50 valid from 30th October, 2009[16].
Type : Grid Connected renewal electricity generation
Sectoral Scope : 1

2.2 Justification of the choice of the methodology and why it is applicable to the project activity:

The project activity qualifies as a small scale project activity and satisfies the following criteria under the methodology AMS I.D., Version 15, 30th October, 2009:

Applicability Criteria	**Justification**
This category comprises renewable energy generation units, such as photo-voltaic, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	The project activity is a new run-of-the-river, small scale hydro-electric project. Hence, is applicable for this category.
Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: ○ The project activity is implemented in an existing reservoir with no change in the volume of reservoir; ○ The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the	The project is a run-of-the-river, small scale hydro- electric project having no reservoir and storage of water. Hence, this criteria is not applicable to the project activity.

[15] http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=43
[16] http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9

power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; o The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.	
If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	Not applicable; there is neither any non-renewable component added, nor any co-firing required for the project activity. The project capacity is of 5 MW capacity, well below the limit of 15 MW.
Combined Heat and Power (co-generation) systems are not eligible under this category.	The project activity is not a combined heat and power (cogeneration) system.
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project is a new hydro electric power plant, thus does not involve any addition of new capacity with any existing renewable energy generation unit.
Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	Not applicable; the project activity is completely new and does not require any retrofit or modification of the existing project activity of renewable energy generation.

2.3 Identifying GHG sources, sinks and reservoirs for the baseline scenario and for the project:

The GHG emission sources included or excluded from the project boundary as considered for the baseline scenario and for the project scenario have been shown below:

Source		Gas	Included?	Justification/ Explanation
Baseline	Grid electricity generation in Baseline scenario	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification (conservative approach)
		N_2O	No	Excluded for simplification (conservative approach)
Project Activity	Electricity generation	CO_2	No	The project activity is a run-of-river, small scale hydro-electric power project with no submergence, hence, no greenhouse gas emissions due to project activity has been considered.
		CH_4	No	
		N_2O	No	
	Submergence due to reservoir	CO_2	No	
		CH_4	No	
		N_2O	No	

2.4 Description of how the baseline scenario is identified and description of the identified baseline scenario:

The present project activity is located in the state of Himachal Pradesh, India. The power generated from the project activity will be exported to the Northern grid which falls within the network of the NEWNE grid [17] (i.e. integrated electricity system) and is highly dominated by thermal based power generating units. Therefore, in the absence of the project, the electricity delivered to the grid would have been generated by the operation of grid connected fossil-fuel based power generating units.

Thus, the project activity does not only displace fossil fuel based power generation but also reduces the associated emissions. Therefore, the baseline emission and the emission reduction from project activity have been estimated based on the quantum of electricity supplied by the project activity to the grid. The Baseline Emission Factor (EF) of the NEWNE grid has been calculated as Combined margin (CM), consisting of the combination of Operating margin (OM) and Build margin (BM) factors with the weight age value of 0.5 each, as per guidance provided in the "Tool to calculate

[17] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm; CO2 Baseline Database for the Indian Power Sector; User Guide, Version 5.0, November 2009; page no. 4; table 2

Emission Factor for an electricity system" [18] and the Methodology AMS-I. D. [19], Version 15, 30th October, 2009 as applicable. The explanation on the detailed baseline calculation has been provided in the ***section 4: GHG Emission Reductions***.

The emission factor values have been sourced from "CO_2 Baseline Database for Indian Power Sector", Version 5.0[20], 1st November, 2009, for the NEWNE grid, published by Central Electricity Authority (CEA), Government of India.

2.5 Description of how the emissions of GHG by source in baseline scenario are reduced below those that would have occurred in the absence of the project activity (assessment and demonstration of additionality):

As per VCS 2007.1[21], the project additionality has been established following "Test 1: The project test".

The Project test:

Step 1: Regulatory Surplus:

[22] The requirement with respect to regulatory surplus (step 1 of each of the three VCS additionality tests, Section 5.8 of the VCS 2007.1) is changed from:

"The project shall not be mandated by any enforced law, statute or other regulatory framework.
to;
The project shall not be mandated by any systematically enforced law, statute or other regulatory framework. Laws, statutes, regulatory frameworks or policies implemented since 11 November 2001 that give comparative advantage to less emissions-intensive technologies or activities relative to more emissions-intensive technologies or activities need not be taken into account. Laws, statutes, regulatory frameworks or policies implemented since 11 December 1997 that give comparative advantage to more emissions-intensive technologies or activities relative to less emissions-intensive technologies or activities shall not be taken into account."

Such change to the requirement with respect to regulatory surplus is effective from 21 January 2010.

Again, as per the update dated 26th January 2010[23],

[18] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf/history_view
[19] http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9
[20] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm
[21] http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007_1.pdf, please refer page no. 16
[22] http://www.v-c-s.org/docs/VCS-Program-Update_21JAN2010.pdf; page no. 3; 1) Regulatory surplus.

"The project shall not be mandated by any law, statute or other regulatory framework applying in the host country that was implemented on or before 11 November 2001, or the compliance rate of any such law, statute or other regulatory framework during (part of) the project crediting period shall be below 50%."

The project activity is not mandatory by any systematically enforced law, statute or other regulatory framework. Therefore, satisfies the criteria of Step 1. and also does not violate any of the VCS program update dated 21st January, 2010 and 26th January 2010. These updates will be further considered during the whole crediting.

Step 2: Implementation Barriers:

Investment barrier:

a) Benchmark analysis

The project investment decision was taken on 15th June, 2004. During the financial assessment of the project, the project IRR has been considered as the financial indicator.

As per EB 51 Report, Annex 58, Guidance on the Assessment of Investment Analysis: (Version 03); Page 3; Point 12: Selection and Validation of Appropriate Benchmarks,

"In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR".
In case of the project activity, the project IRR has been considered as the financial indicator, therefore, Weighted Average Costs of Capital (WACC) has been taken as the benchmark for the project activity. While establishing the benchmark, the expected return on equity has been calculated using the Capital Asset Pricing Model (CAPM). As per CAPM, the required return on equity investment is estimated based on the following:

1. The risk free return is a benchmark figure against which all the investments in an economy should be measured and the value of the same can be sourced from the Weighted Average yield on the Central Government's market loan. The value of the Risk free return (6.12%) has been taken from Reserve Bank of India (RBI) considering 20 years of maturity period as shown in the financial model (Source: http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=5197).

[23] http://www.v-c-s.org/docs/VCS-Program-Update_Extension-of-Scope-to-Include-ODS.pdf; page no. 2; Table 1; 2) Regulatory surplus

2. The guidance on investment analysis requires the use of benchmark which represents standard market returns. These returns are assumed to reflect the risk free rate of return plus a market premium. The capital asset pricing model requires the adjustment of the market premium with the factor 'beta' which represents the volatility of a stock relative to a well diversified market portfolio.

Conventional (mainly large thermal) power projects are more attractive investment options as compared to the small scale hydro projects primarily because of the lower risks that such project activities face and secondly due to the higher plant load factor.

Considering the above, the following beta values[24] for various companies from the power sector have been estimated and the average beta value has been taken i.e. 0.80 which is conservative as compared to the high risks associated with such small and medium scale projects.

While estimating the beta, Neyveli lignite, GIPCL, TATA Power are the private sector listed companies for which data were available, hence have been considered. The other companies like

1. CESC being mainly into the business of Power Distribution has not been considered in to the Benchmark analysis.

2. Reliance Infra has a diversified portfolio including power distribution, road and infrastructure etc., therefore, such projects cannot be truly considered for representative of generation company and has been excluded from the analysis.

3.The Organization like NTPC is purely a Government Utility, therefore, has been excluded from the analysis as it will not truly reflect a private sector operation in practice. Again, the data was available for NTPC from November, 2004 and for JP Hydro from April, 2005, much later of the project investment decision. Hence these two companies have not been considered

Company Name	**Asset Beta (Unlevered)**
Neyveli lignite	1.06
GIPCL	0.56
TATA Power	0.79
Average Beta	0.80

3. Market risk premium as measured is the premium above the risk free rate if the return that investors expect to earn on a portfolio of equities. Equity indices are indicator of expected market

[24] Please refer to the Benchmark analysis for Beta calculation.

return. With a view to eliminating the unsystematic risk associated with the projects totally, index containing 500 companies has been taken to represent the market return. A period starting since 2001 to 2004 has been considered during the selection of BSE 500, which represents a more efficient approach. The duration of April 2001 to March 2004 has been taken to calculate the Market Return. The Electricity Bill came up in the year 2001 and the project was conceptualized in the year 2004. Considering a better subjective view of the market because of reforms that were introduced in the Power Sector after the introduction of Electricity Bill 2001, the proponent has chosen these 3 years as the best assessment period for the project. Based on this, the market risk premium is estimated as follows:

Market Rate of Return (Rm) = [{(BSE index at the time of the investment decision of the project (March, 2004)) / (BSE index at April, 2001)} ^ (1/no. of years from 2001 till the time of the start of project)]-1

= 27.89 %

[Source: BSE-500 indices;
http://www.bseindia.com/histdata/hindices2.asp]

The formula of CAPM as applicable is as follows:

$Re = Rf + \beta (Rm-Rf)$

where:

Re = Rate of return on equity;
Rf = Risk-free rate of return;
β = Beta or systematic risk for this type of equity investment coefficient reflecting the volatility (risk) of the stock relative to the market;
Rm – Rf = Market risk premium;

Using this formula, the expected return on equity has been estimated as 23.63%. Considering this value of expected return on equity and the interest on term loan (10.5%)[25] under debt: equity ratio of 70:30, the Weighted Average Costs of Capital (WACC) has been calculated as 13.61 % and has been considered as the suitable benchmark for the project activity.

b) *Project Internal rate of Return (IRR)*

The project Internal Rate of Return (IRR) has been considered as an indicator to compare with the benchmark during the financial assessment of the project activity. The following assumptions have

[25] http://www.rbi.org.in/scripts/WSSView.aspx?Id=7615, the value shows the range in between 10.25-11%. The PP has opted for 10.5% as a round off value in between the range.

been considered for the estimation of the project IRR for the project activity:

Assumptions:

Parameters	Value	Reference
Installed Capacity (MW)	5	Detailed project Report
Gross Annual Generation (GWh)	23.12	Detailed project Report
Losses	8.00%	Detailed project Report
Net Annual Generation (GWh)	21.27	-
Selling Price per Unit (INR)	2.5	Detailed project Report
O & M Expenses (%)	1.50%	Detailed project Report
Yearly Increase in O&M Cost (%)	5.00%	Detailed project Report
Interest on Term Loan (%)	10.50%	Prime Lending Rate (PLR)
Tenure of Loan (Years)	10	Detailed project Report
Loan Repayment Period (Years)	7	Detailed project Report
Repayment / year	4	Detailed project Report
Moratorium (years)	0	Detailed project Report
Interest on Working Capital (%)	12.50%	Detailed project Report
Income Tax (Corporate Tax) (%)	33.66%	IT Act
Tax Holidays (Subject to MAT) in years	10	IT Act
Subsidy (if any) (INR) (Million)	41	HIMURJA & IREDA
Period of assessment (years)	30	Management Assumption
Emission Factor (tCO_2/ GWh)	840.06	Calculated from CEA database
Rate/ER (USD)	15	Management assumption
Project Cost (INR) (Million)	328.71	Detailed project Report
Capital Structure	70:30	Detailed project Report
Total working Capital Requirement (INR) (Million)	11.30	Management assumption

The project IRR has been estimated as 11.88%, which is lesser compared to the benchmark value of 13.61%. The project IRR will improve considering the emission reduction (ER) revenue.

c) Sensitivity Analysis:

The following sensitivity analysis is further showing that the project IRR does not attain benchmark in case of a favourable scenario considering variations in annual net electricity generation, project cost by (+/-10%). The tariff, considered to be fixed for the project life time and O & M cost contributes only 1.5% towards the total project cost, have been excluded from the sensitivity analysis.

Sl. No.	Indicators	Variation	IRR
1.	Base case		11.88%
2.	Annual Electricity Generation	(+) 10%	13.30%
		(-) 10%	10.37%
3.	Project cost	(+) 10%	10.38%
		(-) 10%	13.63%

From the above analysis, it can be seen that the project IRR touches the benchmark value only at negative variation of project cost by 10%. The project proponent has provided the CA certificate on the enhanced project cost, which shows 7.98% higher cost is involved in the project. Therefore, negative variation of the project cost is not a reasonable scenario.

Step 3: Common Practice:

Being located in the Northern region, the project activity falls under the Northern Regional grid, which is a part of the Integrated grid system, i.e. NEWNE grid. The total installed capacity of the Northern grid was 31, 963 MW[26] during the project conceptualization stage. The total installed capacity of the Northern grid from hydro resource (as per the CEA database, version 1.1) is 10, 790 MW[27] (only 33% of the total installed capacity of the Northern grid), out of which only 107.05 MW of power (less than 1%) is supplied by small scale (≤ 15 MW[28]) hydro power projects, installed by State Government utilities with no private participation.

In the state of Himachal Pradesh also, there was only two large scale hydro projects [29] (also registered under GHG program) and no

[26] http://www.cea.nic.in/planning/c%20and%20e/government%20of%20india%20website.htm, Please refer to the Baseline Carbon Dioxide Emission Database Version 1.1, 21st December, 2006 by Central Electricity Authority (CEA) of India

[27] http://www.cea.nic.in/planning/c%20and%20e/government%20of%20india%20website.htm, Please refer to the Baseline Carbon Dioxide Emission Database Version 1.1, 21st December, 2006 by Central Electricity Authority (CEA) of India

[28] http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=43

[29] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

commissioned small scale hydro project from private sector during the project conceptualization stage[30]. Beside this, during that period, the projects of total capacity of 9.5 MW[31] have been registered under other GHG program in the state of Himachal Pradesh, which further establishes the existing financial risk and the requirement of the ER revenue for the project activity in the region. Therefore the project activity cannot be considered as a common practice.

The registration of the project as a VCS project activity would enable the project proponent to avail revenues from the verified emission reductions to compensate the financial risks associated with the project activity.

3 Monitoring:

3.1 Title and reference of the VCS methodology (which includes the monitoring requirements) applied to the project activity and explanation of methodology choices:

The project activity is a small scale, run-of-the-river, grid connected hydro-electric power project supplying power to the Northern grid which is part of the integrated grid system, i.e. NEWNE Grid[32]. Therefore, the applicable baseline and monitoring methodology is:

Methodology : Approved Methodology i.e. AMS-I.D./Version 15, approved in EB 50 valid from 30th October, 2009[33].
Type : Grid Connected renewal electricity generation
Sectoral Scope : 1

3.2 Monitoring, including estimation, modelling, measurement or calculation approaches:

- ***Purpose of Monitoring:***

  The main purpose of monitoring is to monitor the data used to calculate the actual emission reduction from the project activity. The main parameters that are needed to be monitored are:

  1. The amount of net electricity supplied to the grid

- ***Type of Data & Information to be reported, including units of measurement & origin of Data:***

  Net electricity supplied to the grid by the project activity (EGy) in MWh

[30] http://himurja.nic.in/PCommissioned.html#1
[31] http://cdm.unfccc.int/Projects/DB/DNV-CUK1118238272.96/view & http://cdm.unfccc.int/Projects/DB/DNV-CUK1127461867.35/view

[32] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm
[33] http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9

- ***Origin of data***

Joint Meter Reading (JMR) data at the inter-connection point.

- ***Monitoring, including estimation, modelling, measurement or calculation approaches***

1. Estimation of Emission Reductions:

The project activity is expected to reduce 17, 868 tonnes of CO_2 per year over the whole crediting period. This value is based on the projected Net power supply of 21, 270 MWh and a Combined Margin Emission factor of 0.84006 t CO_2 / MWh.

2. Calculation Approaches:

The estimation of the emission reduction will be based on the actual data of net electricity supply to the grid, from the JMR data.

- ***Monitoring times and period, considering the needs of intended users***

  Monitoring of the data will be done on Monthly basis.

- ***Monitoring roles and responsibilities***

The parameter which will be monitored as per the monitoring plan is the net electricity supplied by the project activity to the grid. A hierarchy model based on the responsibilities for executing the Monitoring plan has been shown below:

Director	Overall management and execution of monitoring plan
Plant Manager	o Recording, reporting and maintaining of the Joint Meter Reading (JMR) data o Quality assurance and control o Periodic calibration as per monitoring plan
Shift engineer/ Support staff	Assist the Plant manager in all the above activities

The Director has the overall responsibility of the successful implementation of the monitoring plan and estimation of the emission reduction.

- ***Managing data quality***

  Joint Meter Reading (JMR) data records and calibration certificates will be maintained both electronically & on paper by the Project Proponent.

3.3 Data and parameters monitored / Selecting relevant GHG sources, sinks and reservoirs for monitoring or estimating GHG emissions and removals:

Data / Parameter:	**EGy**
Data unit:	MWh
Description:	Net electricity supplied by the project activity.
Source of data to be used:	Joint Meter Reading (JMR) at the inter-connection point (sub-station)
Value of data applied for the purpose of calculating expected emission reductions	21, 270
Description of measurement methods and procedures to be applied:	Three phase Four wire Electronic Tri-vector Meters (digital display) are used. Monthly Joint Meter Readings (JMRs) as measured from the Interconnection Point (sub-station) are taken by the designated officials of the Himachal Pradesh State Electricity Board (HPSEB) and the project proponent. There is a separate dedicated transmission line connected to Jari substation. The joint meter readings shall be recorded and signed by the authorised representative (s) of both HPSEB & the proponent. This net supply value from the JMR (covering all the values of the losses, import) will be considered for the calculation of the emission reduction out of the project activity. Same can also be cross checked from invoices raised to HPSEB. The total data will be archived on paper and will be kept at least for 2 years after the end of the last crediting period.
QA/QC procedures to be applied:	Calibration is performed once in a year. If the Main Meter and the Check Meter fail record or of any of the PT fuses have blown out, then the Energy will be

	computed on a mutually agreeable basis between the Company and the Board for that period of defect. In case there is no mutual agreement then the matter will be referred to the Chief Electrical Inspector to the Government of Himachal Pradesh whose decision would be final and binding on both the Parties. The gross generation at project site are also recorded on hourly basis by the project proponent to cross-check any further non- conformity.
Any comment:	-

3.4 Description of the monitoring plan

The parameter which will be monitored as per the monitoring plan is the net electricity supplied by the project activity to the grid.

Reliability:

- The meters installed at the Interconnection point are jointly inspected and sealed on behalf of the Parties and shall not be interfered with either Party except in the presence of the other Party or its accredited representative(s).

- If during the half yearly test checks, the Main Meter is found to be within the permissible limits of error and the corresponding Check Meter is found to be beyond the permissible limits of error, then billing will be as per the Main Meter as usual. The corresponding Check Meter shall, however, be calibrated or replaced with spare tested calibrated meter, as may be necessary.

- If during the half yearly test checks, the Main Meter is found to be beyond permissible limits of error but the Check Meter is found to be within permissible limits of error, then the billing for the month and up to the date and time of the calibration/replacement of the defective Main Meter, shall be as per the Check Meter. Such meter shall be immediately calibrated or replaced with the spare tested/ calibrated meter, as may be necessary, whereafter billing shall be as per the Main Meter.

Frequency:

- Monthly Joint Meter Readings (JMRs) as measured from the Interconnection Point are taken by the designated officials of the Himachal Pradesh State Electricity Board (HPSEB) and the project proponent. The joint meter readings shall be recorded and signed by the authorised representative (s) of both HPSEB & the proponent.

Completeness:

- If the Main Meter and the Check Meter fail record or of any of the PT fuses have blown out, then the Energy will be computed on a mutually agreeable basis between the Company and the Board for that period of defect. In case there is no mutual agreement then the matter will be referred to the Chief Electrical Inspector to the Government of Himachal Pradesh whose decision would be final and binding on both the Parties. The gross generation at project site are also recorded on hourly basis by the project proponent to cross-check any further non- conformity.

4 GHG Emission Reductions:

4.1 Explanation of methodological choice:

The project is a run-of-the-river, small scale hydro - electric project and supplying power to the Northern grid which is part of the integrated grid system, NEWNE Grid[34], which is dominated by fossil fuel based thermal power plants.

Hence, the applicable baseline methodology is "AMS I.D., Version 15 of Sectoral Scope 01, 30th October, 2009[35]".

- **Calculation of Baseline Emission (BE)**

According to AMS-I. D, "*the baseline emission is the product of electrical energy baseline* $EG_{BL,\ y}$ *expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor*".

$$BEy = EG_{BL,\ y} \times EF_{CO2}$$

[34] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

[35] http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9

Where:

BE_y = Baseline Emissions in year y; t CO_2
$EG_{BL, y}$ = Energy baseline in year *y*; kWh
EF_{CO2} = CO_2 Emission Factor in year y; t CO_2e/kWh

The description below follows the steps of the "Tool to calculate the emission factor for an electricity system, Version 2, 16th October, 2009[36]".

Step 1: Identify the relevant electricity systems

The Indian power system is divided into two independent grids, namely new Integrated Northern, Eastern, Western, and North-Eastern regional grid (NEWNE)[37] and the Southern Grid. The project activity is located in Himachal Pradesh, which comes under NEWNE Grid.

Therefore, NEWNE Grid has been used as the reference grid system for estimating the baseline emission.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

As per the "Tool to calculate the emission factor for an electricity system" (Version 2), any one of the two methods can be used;

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

Option 1 has been followed for the project activity and subsequent "Tool to calculate the emission factor for an electricity system"[38] has been applied for the project activity.

Step 3: Select a method to determine the operating margin (OM)

For calculation of operating margin four options are available:

Option 1. Simple operating margin;
Option 2. Simple adjusted operating margin;
Option 3. Dispatch data analysis operating margin;
Option 4. Average operating margin.

As per the "Tool to calculate the emission factor for an electricity system", any of the four methods can be used, however, the simple OM method can be used only if the low-cost/must run resources

[36] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf
[37] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm
[38] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf; page no. 4-5; Step 2

constitute less than 50% of the total grid generation in: 1) average of the five most recent years, or 2) based on long term averages for hydroelectricity production.

In NEWNE Grid, the low-cost/must run resources are varying from 16.8% to 19% of the total grid generation.

[39]Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
	2004-05	2005-06	2006-07	2007-08	2008-09
NEWNE	16.8%	18.0%	18.5%	19.0%	17.3%
South	21.6%	27.0%	28.3%	27.1%	22.8%
India	18%	20.1%	20.9%	21.0%	18.6%

Hence simple OM has been opted.

Step 4: Calculate the operating margin emission factor according to the selected method

The Central Electricity Authority (CEA) of India has published the CO_2 Baseline Database, Version 5, dated 1st November, 2009, on official emission factors for all regional grids in India. Application of this officially published database represents the most accurate approach, hence, has been applied in this project activity.

As per the "Tool to calculate the emission factor for an electricity system", the calculation of OM has been done ex - ante based on the most recent 3 years for which data is available at the time of PDD submission.

Last Three year average of the Operating Margin[40]:

Year	2006-07	2007-08	2008-09	Average
Operating Margin Emission Factor (tCO_2e/ MWh)	1.008	0.999	1.006	1.00493[41]

STEP 5. Identify the group of power units to be included in the build margin (BM).

Build Margin (BM) calculation is based on 20% most recent capacity additions in the grid based on net generation.

The value of BM has also been taken from "CO_2 Baseline Database for the Indian Power Sector", Version 5, 1st November, 2009, published by Central Electricity Authority (CEA), Government of India.

STEP 6. Calculate the build margin emission factor.

[39] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm; Central Electricity Authority: CO_2 Baseline Database. Version 5, 1st November, 2009

[40] Central Electricity Authority: CO_2 Baseline Database. Version 5, 1st November, 2009

[41] Reference: Emission Reduction Calculation spreadsheet

The values selected are officially published by CEA and reflects best and accurate practice.

Year	2008-09
Build Margin Emission Factor **(**tCO_2e / MWh**)**	0.67518

STEP 7. Calculate the combined margin (CM) emissions factor.

The CO_2 Emission Factor (i.e. baseline emission factor) in year y has been calculated as the combination of the OM and BM emission factors with the weight age value of 0.5 each. The resulting Combined Margin is fixed ex ante for the duration of the crediting period:

EFy = $W_{OM} \times EF_{OM, y} + W_{BM} \times EF_{BM, y}$

Where,

EF_y	= Combined Margin Emission Factor determined above
W_{OM}	= Weighting of Operating Margin
$EF_{OM, y}$	= Operating Margin Emission Factor
W_{BM}	= Weighting of Build Margin
$EF_{BM, y}$	= Build Margin Emission Factor

4.2 Quantifying GHG emissions and/or removals for the baseline scenario:

The baseline emission is the product of electrical energy baseline $EG_{BL,y}$ expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor.

$BE_y = EG_{BL, y} * EFco_2$

Where:
BE_y = Baseline Emissions in year y; t CO_2
$EG_{BL, y}$ = Energy baseline in year y; kWh
EF_{CO2} = CO_2 Emission Factor in year y; t CO_2e/kWh = $\mathbf{EF_y}$

$$\mathbf{EF_{CO2} = w_{OM} \times EF_{OM, y} + w_{BM} \times EF_{BM, y}}$$

$EF_{OM, y}$ = Operating Margin Emission Factor (tCO_2/MWh)
$EF_{BM, y}$ = Build Margin Emission Factor (tCO_2/MWh)

As per "Tool to calculate the emission factor for an electricity system", w_{OM} = 0.50 and w_{BM} = 0.50 for hydro electric projects.

The Operating Margin as calculated in the section 4.1 for the NEWNE Grid is 1.00493 tCO_2e /MWh and the Build Margin is 0.67518 tCO_2e/MWh.

Therefore, EF_y = 0.50 × 1.00493 + 0.50 × 0.67518
= 0.84006 tCO_2 e/ MWh

∴ BE_y = [42]21, 270 MWh x 0.84006 tCO_2 e/MWh
= 17, 868 **tCO_2e per year**

Where:

BE_y = Baseline emissions in year *y* (tCO_2)
EG_y = Electricity generated in the project plant in year y (MWh)
EF_y = Baseline emission factor in year y (tCO_2/MWh)

4.3 Quantifying GHG emissions and/or removals for the project:

- *Calculation of the Project Emissions (PEy):*

As per AMS-I.D, Version 15, 30th October, 2009[43], page no. 6, point no. 14 "*for most renewable energy project activities, PE_y = 0*". The project activity is a small scale, renewable energy based hydro electric project and does not come under the projects as referred in the methodology, therefore, PEy = 0.

- *Leakage calculation (LEy):*

As per AMS -I. D. Version 15, 30th October, 2009, page no. 6, point no. 15 "*If the energy generating equipment is transferred from another activity, leakage is to be considered*". Therefore, the project activity does not result in any direct or indirect emission of greenhouse gases, or any leakages.

Hence, LEy = 0

[42] Sourced from the Detailed Project Report (DPR)

[43] http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9

4.4 Quantifying GHG emission reductions and removal enhancements for the GHG project:

Net estimated Emission Reduction per year (ERy):

$$ER_y = BE_y - PE_y - LE_y$$

Where:
ER_y = Emission reductions in year y (t CO_2e/y).
BE_y = Baseline Emissions in year y (t CO_2e/y).
PE_y = Project emissions in year y (t CO_2e/y).
LE_y = Leakage emissions in year y (t CO_2e/y).

As $PE_y = LE_y = 0$; $ERy = BEy = EG_{BL,y} * EF_{CO2}$

Therefore, ER_y = 17, 868 tonnes of CO_2e per year.

Year	Estimation of project activity emissions (tCO_2e)	Estimation of baseline emissions (tCO_2e)	Estimation of leakage (tCO_2e)	Estimation of overall emission reductions (tCO_2e)
2008-2009	0	17, 868	0	17, 868
2009-2010	0	17, 868	0	17, 868
2010-2011	0	17, 868	0	17, 868
2011-2012	0	17, 868	0	17, 868
2012-2013	0	17, 868	0	17, 868
2013-2014	0	17, 868	0	17, 868
2014-2015	0	17, 868	0	17, 868
2015-2016	0	17, 868	0	17, 868
2016-2017	0	17, 868	0	17, 868
2017-2018	0	17, 868	0	17, 868
Total (tonnes of CO_2e)	**0**	178, 680	**0**	178, 680

5 Environmental Impact:

As per the Environmental Impact Assessment (EIA) Notification - 2006[44], page no. 10, point no: 1 (c), being a 5 MW run-of-the-river, small scale hydro-electric project with no submergence and reservoir i.e. storage of water, the project activity does not require to attain *Environmental Clearance*.

[44] Source: http://envfor.nic.in/legis/eia/so1533.pdf
I. S.O.1533 (E), [14/09/2006] - Environmental Impact Assessment Notification-2006

6 Stakeholders' comments:

The project activity is a run-of-the-river, small scale hydro-electric project with no storage involved, hence, no submergence and Rehabilitation & Resettlement (R & R) have taken place due to the project activity. As per the EIA Notification, 2006[45], as referred above in point 7 (i), the project activity does not require to conduct Stakeholders' Consultation.

However, before implementing the project, in a local Panchayat meeting dated 26th December, 2002, the project was discussed by the Project officials, members of the Panchayat, local villagers. After the meeting, a No Objection Certificate has been issued by the Local Panchayat for this project.

All the other stakeholders identified for the project activity have found that the project activity is having no significant adverse impacts on the environment and is satisfactory in meeting the criteria of development of the environment, social, economical aspects. In support of this, necessary regulatory clearances / approvals for implementing the project have been received as mentioned in the sections 1.10 and 1.16 respectively, which further indicates that there is no adverse impact associated with the project activity.

7 Schedule:

Sl. No.	Project activities	Date
1.	Contract for Electro - Mechanical (E & M) works with M/s VA Tech Escher Wyss Flovel Ltd.	1st January, 2005
2.	Project Commissioning	2nd April, 2008
3.	Frequency of Monitoring	hourly
4.	Reporting of Monitoring	Monthly
5.	Project period	30 years
6.	Crediting period start date	[46]2nd April, 2008
7.	Crediting period	10 years (Renewable)

[45] Source: http://envfor.nic.in/legis/eia/so1533.pdf
I. S.O.1533 (E), [14/09/2006] - Environmental Impact Assessment Notification-2006; page no. 4

[46] http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007_1.pdf. As per the Voluntary Carbon Standard 2007.1, page no: 7; the project crediting period start date is "the date on which the first monitoring period commences."

8 Ownership:

8.1 Proof of Title:

- The Electro-Mechanical (E & M) Contract between M/s VA Tech Escher Wyss Flovel Ltd. and Harisons Hydel Construction Co. (P) Limited (HHCCPL);
- Commissioning certificate issued by Himachal Pradesh State Electricity Board (HPSEB) to Harisons Hydel Construction Co. (P) Limited (HHCCPL)
- Techno-economic clearance for the project activity issued by Himachal Pradesh State Electricity Board (HPSEB)

The project activity is in line with the VCS program update dated 21st January, 2010.

8.2 Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

Not Applicable.

The project activity does not participate in any other GHG program.