

86 MW Hydro Project in Himachal Pradesh

MONITORING REPORT- THIRD VER VERIFICATION

Monitoring Period: 01/04/2008 to 31/3/2009 (Inclusive of both days)

Version: 2.0

Date: 13/5/2009

Malana Power Company Limited

Bhilwara Towers, A-12, Sector -1

Noida-201301

Uttar Pradesh

India

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1.0 Project Details

The purpose of the project activity is to generate electricity by using the renewable energy sources (water) for a grid system in the state of Himachal Pradesh, India. The project activity displaces electricity and green house gases (GHG) emissions currently produced by thermal fossil fuel-burning facilities. The generated electricity by the project activity is being exported to the PTC (Power Trading Company) India Ltd., a power trading and utility company owned by Government of India, under the power trading agreement. This electricity will be further delivered to HVPNL (Haryana Vidyut Prasar Nigam Limited and MPCL (Madhya Pradesh Power Corporation Ltd.).

The electricity generation facility is installed on Malana Nallah, a tributary of Parbati River. The project activity entails installation of two turbine of capacity 43MW each along with other auxiliary devices implemented at village Jari, Kullu District, Himachal Pradesh.

1.1 Technology Description

The project is a grid connected hydel power plant which is run of the river with a small reservoir. It involved construction of a barrage across Malana Nallah 3 Km downstream of Malana village, a head regulator, a de-silting basin storage reservoir to divert water draft of 21cumecs through a 3.2 Km long headrace tunnel, ending in a 5 m diameter surge shaft. A pressure shaft conveys water through a 2.2 m diameter surface penstock to 2 Pelton turbines housed in a surface powerhouse.

2.0 Reference

Methodology: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Reference: Approved consolidated baseline methodology; ACM0002/Version 06, Sectoral Scope: 1, 19 May 2006.

The project is a Renewable Energy project with maximum output capacity of 86 MW

Project Design Document: “86 MW Hydro Project in Himachal Pradesh”

Version: 2, Dated: 25/12/2006

Second Monitoring Report

“86 MW Hydro Project in Himachal Pradesh”, Monitoring report – VERs

Version: Ver 02

Date of completion of the Monitoring Report: 13/05/2008

3.0 Monitoring methodology and plan

The project activity meets the applicability criteria of the 'Approved baseline methodology ACM0002'. The applicability criteria of the 'Approved monitoring methodology ACM0002' are identical to those of the 'Approved baseline methodology ACM0002'. Therefore the project activity has used the 'Approved monitoring methodology ACM0002' in conjugation with the 'Approved baseline methodology ACM0002' for the project activity.

In keeping with the Monitoring Methodology, the following parameters are to be monitored in the specific project situation:

- Net electricity supplied to the state grid by project activity.

4.0 Quality Control (QC) and Quality Assurance (QA)

Refer Annex-1

4.1 Calibration/Maintenance of Measuring and Analytical Instruments

Electricity meters are properly maintained with regular testing and calibration schedules developed as per the technical specification requirements to ensure accuracy. Electricity supply data to the grid could also be cross-checked with the invoices for sale of electricity to the consumers. The meters installed are of accuracy class 0.2 and are calibrated on annual basis.

5.0 GHG Calculations

5.1 Project Activity Emissions

Since, the proposed project activity is a renewable energy project which generates electricity using hydro power; no anthropogenic emissions by sources of greenhouse gases within the project boundary are identified. Hence, no formulae are applicable.

5.2 Leakages

No anthropogenic greenhouse gases by sources outside the project boundary that are significant, measurable and attributable to the project activity are identified. Hence, no leakage is considered from the project activity. In addition, project proponents confirm

that the renewable energy technology is not equipment transferred from another activity. Hence, no leakage calculation is required.

5.3 Baseline Emissions

“The baseline is the MWh produced by the renewable generating unit multiplied by an emission coefficient (measured in tCO₂equ/MWh) calculated in a transparent and conservative manner as: **The weighted average emissions (in tCO₂equ/MWh) of the current generation mix.**

$$BE_y = EF_y \times EG_y$$

Where

BE_y: Baseline emissions due to displacement of electricity during year y in tons of CO₂

EG_y: Electricity supplied to the grid by the project activity during the year y in MWh, and

EF_y: CO₂ baseline emission factor for the electricity displaced due to the project activity in during the year y in tons CO₂/MWh.

Energy supplied to Grid

The energy supplied to grid is measured using electricity meters at the supply points. The net electricity supplied is measured as

$$EG_y = \text{Total Generation} - \text{Auxiliary Consumption}$$

Annual power generation details are as follows (all figures in MWh)

Month	Net Generation EG _y (Power Supplied to Grid) (MWh)
April-08	15,645
May -08	29,744
June -08	63,966
July -08	73,165
August -08	73,250
September -08	36,642
October -08	21,190
November -08	12,560
December -08	9,334
January -09	7,259
February -09	5,808
March -09	7,300
Total	355,865

Grid Emission Factor

The GEF is fixed ex-ante in the PDD as given below:

Parameter	Value
OM	0.98
BM	0.53
CM	0.75

Therefore $EF_y = 0.75 \text{ tCO}_2/\text{MWh}$

Baseline Emissions

Formula for Baseline emissions as discussed is $GEN_i * GEF$ (for a particular year)

Sr. No.	Month	Energy Generated (KWh)	Energy Sent Out (KWh)	Gross Energy Injected at Sub - Station (KWh)
1	April, 2008	27,236,576	27,170,352	15,645,024
2	May, 2008	30,413,472	30,308,040	29,743,848
3	June, 2008	48,055,744	47,886,552	63,966,096
4	July, 2008	68,712,128	68,483,880	73,165,104
5	August, 2008	70,389,376	70,132,392	73,249,920
6	September, 2008	36,224,608	36,064,008	36,642,283
7	October, 2008	14,946,496	14,892,408	21,190,032
8	November, 2008	10,673,824	10,624,536	12,559,896
9	December, 2008	7,754,592	7,714,656	9,334,296
10	January, 2009	6,811,136	6,778,800	7,259,472
11	February, 2009	6,108,992	6,089,184	5,808,456
12	March, 2009	12,497,632	12,463,992	7,300,224
	Total	339,824,576	338,608,800	355,864,651

Sr. No.	Month	Net Generation (Power supplied to grid) in KWh	Baseline emissions tCO ₂
1	April, 2008	15645024	11,734
2	May, 2008	29743848	22,308
3	June, 2008	63966096	47,975
4	July, 2008	73165104	54,874
5	August, 2008	73249920	54,937
6	September, 2008	36642283	27,482
7	October, 2008	21190032	15,893
8	November, 2008	12559896	9,420
9	December, 2008	9334296	7,001
10	January, 2009	7259472	5,445
11	February, 2009	5808456	4,356
12	March, 2009	7300224	5,475
	Total (in MWh)	355865	266,898

5.4 Emission Reductions

$$ER_y = BE_y - PE_y - L_y$$

BE_y = Baseline Emissions as calculated in Section 5.3

PE_y = Project emissions = 0

L_y = Leakages = 0

Month	Emission Reductions
April-08	11,734
May -08	22,308
June -08	47,975
July -08	54,874
August -08	54,937
September -08	27,482
October -08	15,893
November -08	9,420
December -08	7,001
January -09	5,445
February -09	4,356
March -09	5,475
Total	266,898

So a total Emission Reduction of = **266898 tCO₂** is achieved by Project activity from 01 April 2008 to 31 Mar 2009.

6.0 Environmental Impact

There are no negative environmental impacts from the project activity.

Annex-1

Monitoring details

In this project the emissions reductions depend on following factors.

1. Electricity supplied by project activity to the grid during a year.
2. The Grid Emission Factor for northern region grid.

As described in PDD the following data values shall be monitored to calculate the emission reductions.

Data / Parameter:	GEN_{i,y}
Data unit:	MWh
Description:	The units supplied by the project activity (hydel power project) to the NR grid during a particular year.
Source of data used:	Meters installed at the project site would accurately monitor electricity supplied to the grid. Invoice details of these sales to various customers could also be used for cross-checking the data.
Value applied:	Tabulated in Section 5.3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Electricity meters are properly maintained with regular testing and calibration schedules developed as per the technical specification requirements to ensure accuracy. Electricity supply data to the grid could also be cross-checked with the invoices for sale of electricity to the consumers.
QA / QC procedure applied	These meters are maintained by state electricity board. These meters are regularly calibrated and the records maintained by state electricity department. Copies of same have been provided.
Any comment:	

Annex -2

Contact details:

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