

MONITORING REPORT FORM (CDM-MR) *

Version 01 - in effect as of: 28/09/2010

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* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT
Version 1.0 and date 02/01/2012
6 MW HARANGI PHASE –II HYDRO POWER PROJECT IN KARNATAKA, INDIA
Reference Number: 3594
Monitoring Period: 01
Monitoring Period: 31/08/2010-30/09/2011 (both days included)

SECTION A. General description of the project activity

A.1. Brief description of the project activity:

Purpose of the Project Activity:

The project activity is a 6 MW small hydro power project developed by Energy Development Company Limited (EDCL). This project activity, Harangi Hydro-Electric Project (HEP) Phase-II has been installed in order to tap the *excess* hydro power generation potential of river Harangi during overflow season.

The project activity is installed to utilize the head available between the upstream Harangi river in Coorg , Karnataka and the irrigational canal . The project generates power and exports the same to the Southern Regional Grid. It is to be noted that the generation of power by the by the project activity is subject to the demand of irrigation water through the canal. In absence of sufficient irrigation demand, excess water must be vented through the main course of the Harangi River downstream of the dam. During the overflow season (July-September), the water available exceeds the irrigation demand. The project activity utilizes this excess water to generate clean power.

Notably, this project will generate power only during the overflow (monsoon) season. The discharge from the tail race of the Phase - I serves as the intake for the 6 MW Phase-II project, and therefore the availability of excess water is a major controlling factor for the power generated by the project activity.

Brief description of the installed technology and equipments:

The project activity comprises of a 6 MW run-of-the-river hydro power plant. The river water is diverted through a high concrete gravity and gated diversion weir. It is then guided through a penstock gate and jetted into the turbine. This action rotates the turbine which in turn rotates the generator thus producing electricity. Horizontal shafts, Kaplan turbines have been installed at the project site. The electricity after meeting the in-house auxiliary consumption is exported to the Southern Regional Grid.

Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.)

The construction of the project activity started in June, 2007 and it took almost 3 years to complete the construction. The project activity was commissioned on 30th August, 2010 and it has continued operation since then with no major interruption in generation.

Total emission reductions achieved in this monitoring period.

The total emission reduction achieved during this monitoring period (31/08/2010-30/09/2011- both days inclusive) is 8,100 tCO₂ .

A.2. Project Participants

Name of the party involved ((host) indicates a host party)	Private and/or public entity(ies) Project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India	M/s. Energy Development Company Limited	No

A.3. Location of the project activity:

The Harangi Phase-II hydro power is located on the Harangi river near Hudgar Village of Somawarpet Taluk in District Kodagu in Karnataka.

The site is 36 km from Madikeri, the nearest town. The nearest railway station is Mysore, which is 156 km by road. Bengaluru, the nearest international airport, is 257 km away

The geographical co-ordinates of the Harangi Phase-II power plant:

Latitude - 12°29'34'' N &

Longitude - 75° 54'20'' E.

A.4. Technical description of the project

The hydro power plant consists of a gated diversion weir, power block comprising of trash rack, inlet-gate, penstock, turbine generator and powerhouse. The technical specifications of the above mentioned components are provided in the table below:

1. CROSS REGULATOR GATE	
Size of Gate	4.205m x 3.5 m
No. Of Gates	4
FSL at D/s Cross Regulator	Elevation 848.6m
Bottom level of Cross Regulator	EL 845.6m
2 INTAKE, APPROACH CHANNEL & PENSTOCK	
Length of Intake Channel	21 m
Size of Approach channel	7m x 47 m
Intake Gate	4.5m x 4.5 m
Escape Gate	6m x 2m
Penstock Diameter & Length	4.3m & 36 m
3 POWERHOUSE	
Type of building	Surface
Location	By the side of Present Escape Channel
Proposed Capacity of unit	1x6000 kW
Size of Power House :	27.67m(length)x10.69m(width)

4. TURBINE/GENERATOR	
Design Discharge	54.32Cumecs
Type of turbine :	Horizontal Kaplan (Propeller)
Turbine Speed	750rpm
Type of Generator	Synchronous
Generation voltage, Frequency& speed:	11V+/-10%, 50Hz+/-5%,3PH, 4W
Grid Network Voltage :	66kV+/-10%,3ph, 4wire,50Hz

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

Title of Approved Baseline Methodology: ‘Grid Connected Renewable Energy Generation’

Reference of the Approved Baseline Methodology: Category I.D – Renewable Energy Projects – Version 13 of AMS –I.D., Sectoral Scope 1, EB 36 of the Appendix B of the Simplified Modalities and Procedures (M&P) of Small Scale CDM Project Activities

A.6. Registration date of the project activity:

31st August, 2010

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

The crediting period for the project activity is 10 years.

Start Date of the crediting period: 31/08/2010

End Date of the crediting period: 30/08/2020

A.8. Name of responsible person(s)/entity(ies):

Contact Information of Responsible Person

Designation: Advisor

Responsible Person: Mr L.K. Sadani

Mobile: +91-98310 27058

E-mail: llksadani@gmail.com

Address : EDCL House-1-A,Elgin Road, Kolkata – 700020,West Bengal

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

The 6 MW hydro power plant is located on the Harangi river near Hudgar Village of Somawarpet Taluk in District Kodagu in Karnataka.

The project was commissioned on 30th August, 2010 and is operational since then.

There have been no events or situations during the monitoring period, which may impact the applicability of the methodology.

B.2. Revision of the monitoring plan

There is no change in the monitoring plan of the project activity.

B.3. Request for deviation applied to this monitoring period

No deviations have been applied for this project activity.

B.4. Notification or request of approval of changes

Not Applicable

SECTION C. Description of the monitoring system

The monitoring system for the CDM project activity has been developed in order to determine the baseline emissions and the project emissions (if any) over the entire credit period.

Objective

- To ensure proper monitoring and recording of all the parameters required for the computation of emission reductions from the project activity (as mentioned in Section B.7.1 of the registered PDD)
- To ensure proper evaluation of the project activity performance at regular intervals
- To identify the discrepancies in the data monitoring, recording and archiving system and to open up the opportunities for future improvement.

The project proponent has developed a 'CDM Team' that is involved in the monitoring, reporting and verification of GHG performance related parameters.

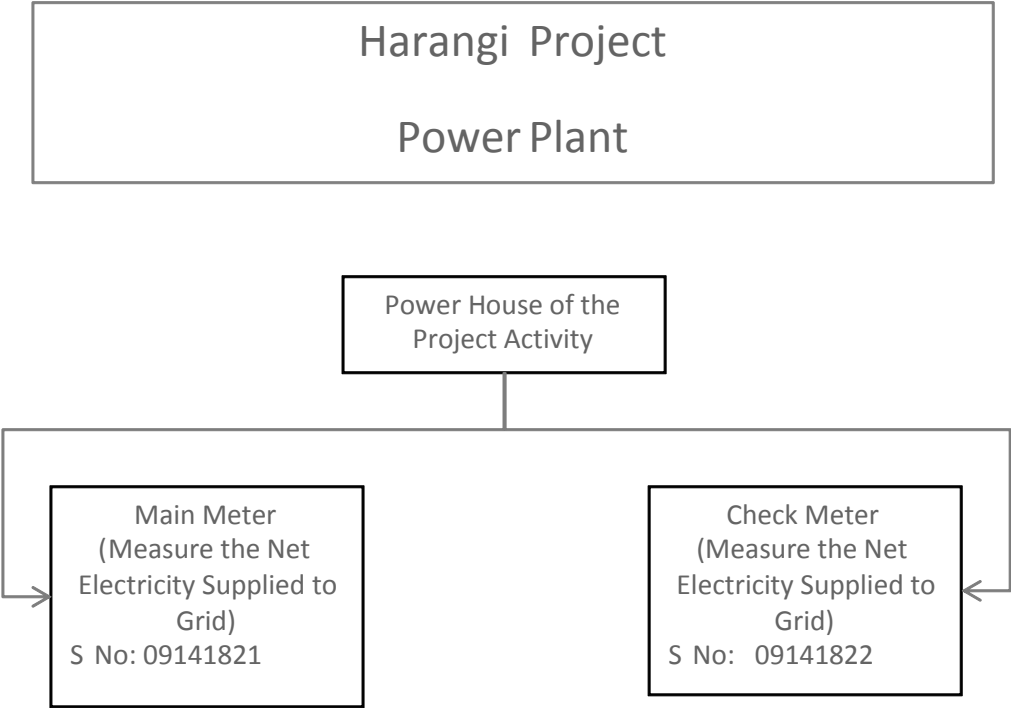
Recording & Reporting of Data:

Measurement of the gross electricity generated by the project activity is done at the plant premises, where there is a dual energy metering system – (i) bi-directional external metering system comprising of the main meter, that will be sealed, maintained and calibrated by HESCOM and (ii) bi-directional internal metering system comprising of the check meter that is maintained and calibrated by the project proponent. A logbook is maintained by the Shift in charge to record hourly readings from the check meters installed at the plant site. This hourly data is signed off at the end of every shift by the engineer in charge of the shift and again at the end of each day by the power plant manager. Joint meter reading is also taken by the HESCOM officials and EDCL personnel once in a month and is the basis of the monthly Electricity Bills. The external meter is calibrated by HESCOM officials once a year and is not under the control of the project proponent.

QA/QC Procedure to be followed: The parameters are monitored with meters of reputed make. The main meter is sealed maintained and calibrated by HESCOM where as the check meter is maintained and calibrated by the project proponent. Remedial actions are immediately undertaken in case any discrepancy is identified. According to the state electricity board's (grid operator) regulations also, the calibration and verification of electricity meters are mandatory for all power generating units. Emission reductions will be claimed on the basis of the figures mentioned in the electricity bills

Verification of monitored parameters: The readings recorded by the Shift In-charge in the Plant Log Book are verified by the Engineer-in-Charge on a daily basis. The Internal Audit, conducted once in a year by Management, ensures the compliance of the monitoring system as described in the 'Monitoring Plan'. In case of any non compliance of the monitoring system from that of the 'Monitoring Plan', corrective actions are suggested by the Internal Audit team. The same is addressed on a priority basis by the Project Management Team. Reviewing of such corrective actions is included in the agenda of the subsequent Internal Audit.

Line Diagram showing Monitoring Points



SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	EF _{GRID}
Data unit:	tCO ₂ /MWh
Description:	Emission Factor of the Southern Regional grid (tCO ₂ /MWh)
Source of data used:	CO ₂ Baseline Database for Indian Power Sector (Version 3.0, December 2007) published by Central Electricity Authority, Ministry of Power, Govt. of India, calculated in accordance to the 'Tool to calculate the emission factor for an electricity system-Version 01 (EB 35)'
Value(s) :	0.85
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The value of EF _{GRID} considered has been calculated in CO ₂ Baseline Database for Indian Power Sector (Version 3.0, December 2007), calculated in accordance to the ' <i>Tool to calculate the emission factor for an electricity system</i> '-Version 01 (EB 35)'
Additional comment:	Please refer Annex 3 of the registered PDD for details.

D.2. Data and parameters monitored

Data / Parameter:	EG _y					
Data unit:	MWh					
Description:	Net units of electricity substituted in the Southern Regional Electricity grid during the year y.					
Measured /Calculated /Default:	Calculated					
Source of data:	Records of Electricity bills raised by project proponent (EDCL) to the Hubli Electricity Supplier Company Limited (HESCOM)					
Value(s) of monitored parameter:	9,530 MWh					
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emissions					
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type	Accuracy Class	Serial Number	Calibration Frequency	Date of last calibration	Validity
	Main Meter	0.2s	09141821	Yearly	23/08/2011	1 year
	Check Meter	0.2s	09141822	Yearly	23/08/2011	1 year
Measuring/ Reading/ Recording frequency:	Monthly					
Calculation method (if applicable):	Total import from the grid is subtracted from total export to get the net export. The calculations are given in the electricity bills raised by EDCL to HESCOM.					
QA/QC procedures applied:	The net generation obtained as a difference between Gross electricity and Auxiliary consumption from the plant log books is used as a cross reference in case of any discrepancy					

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

The start date of the monitoring period for the project activity is 31st August, 2010 i.e. the date of registration of the project activity. The emission factor for the southern grid has been calculated ex-ante the same will be fixed for the entire crediting period. Grid Emission Factor (EF_{GRID}) = 0.85 tCO₂/MWh. The value of net electricity exported to the grid is taken from the monthly invoices that EDCL Power Projects Limited raises to Kerala State Electricity Board.

The generation details for the current monitoring period are provided in the table below:

Month	Net Export to Grid in MWh	CO ₂ emission factor of the grid tCO ₂ / MWh	Emission Reductions tCO ₂
Aug-10(Consider on and from 31/08/2010)	0	0.85	0
Sep-10	1,086.7	0.85	923.72
Oct-10	0	0.85	0
Nov-10	0	0.85	0
Dec-10	0	0.85	0
Jan-11	0	0.85	0
Feb-11	0	0.85	0
Mar-11	0	0.85	0
Apr-11	0	0.85	0
May-11	0	0.85	0
Jun-11	0	0.85	0
Jul-11	3,367.4	0.85	2862.27
Aug-11	2,920.1	0.85	2482.04
Sep-11	2,156	0.85	1832.56
Total	9530		8100

Net units of electricity substituted in the Southern Regional Electricity grid during the monitoring period (EG_y) = **9,530 MWh**

Now, Baseline Emission $BE_y = EG_y * EF_{GRID}$

Baseline Emission for the monitoring period under consideration = ((9530 X 0.85)) tCO₂
= **8,100 tCO₂**

E.2. Project emissions calculation

As per section B.6.1 of the registered PDD the Project Emission is taken to be zero.

E.3. Leakage calculation

As per the guidelines prescribed in the methodology applied to this project activity, AMS-I.D Version 13, *“If the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.”* Hence for this case the leakage emission will be zero.

Thus, Leakage Emissions (LE_y) = 0 tCO₂

E.4. Emission reductions calculation / table

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Total baseline emissions (BE_y): 8,100 tCO₂

Total project emissions (PE_y) : 0 tCO₂

Total leakage (LE_y): 0 tCO_{2e}

Total emission reductions: Baseline Emission – Project Emission – Leakage Emission
= 8,100-0-0
= 8,100 tCO₂

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO ₂)	5,591 tCO ₂	8,100 tCO ₂

E.6. Remarks on difference from estimated value in the PDD

As per the registered PDD the estimated ex-ante emission reduction from the project activity equals to 5,154 tCO₂/annum.

Hence for the present monitoring period the estimated emission reduction equals to 5,591 tCO₂ (Monitoring period cover a total of 396 days)

With respect to the ex-ante calculations of the project activity, the monitored figures show an increase by ~44%. However, it is to be noted that project activity depends on the excess flow of water during the monsoon season, and the seasonal variation of the rainfall during the monsoon months in the current monitoring period have affected the generation.

History of the document

Version	Date	Nature of revision
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01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Guideline, Form Business Function: Issuance		