9 MW NERIA HYDROELECTRIC PROJECT, KARNATAKA, INDIA

Document Prepared by EKI Energy Services Limited

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Project Title	9 MW Neria Hydroelectric Project, Karnataka, India
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Monitoring Period	01-September-2011 to 26-July-2016 (Inclusive of start and end dates)
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CONTENTS

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Bhoruka Power Corporation Limited (BPCL) has implemented small hydropower project with two identical generating units of 4.5 MW capacity each to make total installed capacity of 9 MW. The project is situated near Dharmasthala in Dakshina Kannada District of Karnataka state, India. The project is conceived as a run of the river hydroelectric project and hence no storage facility such as dam is envisaged in the project design.

The main purpose of the project activity is generation of electricity using hydro potential available in river Neria, a tributary of river Netravathi, for a grid system Karnataka Power Transmission Corporation Ltd. (KPTCL) through sustainable means without causing any negative impact on the environment and to contribute to climate change mitigation efforts. In the absence of the project the electricity of equivalent quantity would have been provided by the fossil-fuel dominated electricity grid – hence electricity supply from electricity grid is considered as the baseline in this project.

The two units of this 9 MW run-of-river hydro power project were commissioned on the same day - i.e. 27-July-2006.

Date of Commissioning

Unit #	Installed Capacity	Date of commissioning
Unit 1	4.5 MW	27-July-2006
Unit 2	4.5 MW	27-July-2006

The present monitoring period is chosen from 01-September-2011 to 26-July-2016. The net electricity supplied to the state grid by the project activity is 98.78164 GWh or 98781.64 MWh and the emission reductions are 84,642 tCO_2e for the present monitoring period.

1.2 Sectoral Scope and Project Type

Sectoral scope 1: Energy Industries (renewable / non-renewable sources).

Project type: Renewable energy project

The project activity is not a grouped project

1.3 Project Proponent

Organization name	Bhoruka Power Corporation Limited
Contact person	Mr. S Chandrasekhar
Title	Managing Director
Address	48, Lavelle Road, Hitananda 2, Bengaluru-560001, Karnataka, India
Telephone	+ 91 80 2227 2271 – 74
Email	bhoruka@bhorukapower.com

1.4 Other Entities Involved in the project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Mr. Souvik Mitra
Title	Project Manager
Address	Office No 201, Plot No 48, Scheme 78, Vijay Nagar Part- II, Indore 452010, India
Telephone	+91-9109120945
Email	souvik@enkingint.org

1.5 Project Start Date

The project has been completed and the Units were synchronized with KPTCL grid as follows:

Unit – I: 27-July-2006

Unit – II: 27-July-2006

Hence, 27-July-2006 is considered as the start date of the project activity.

1.6 Project Crediting Period

The crediting period of the project activity is for 10 years: 27-July-2006 to 26-July-2016

The project was also registered in CDM with UNFCCC reference number 1549[1] on 09-October-2008 and the crediting period of the CDM project is: 09-October-2008 to 08-October-2018 (fixed)

GHG credits issuance history

1. 27-July-2006 to 30-September-2008 verification done under VCS
2. [2]09-October-2008 to 31-October-2009 under CDM (1st verification under UNFCCC) and 01-November-2009 to 31-August-2011 under CDM (2nd verification under UNFCCC)

1.7 Project Location

Location of the project activity is given below:

Country: India

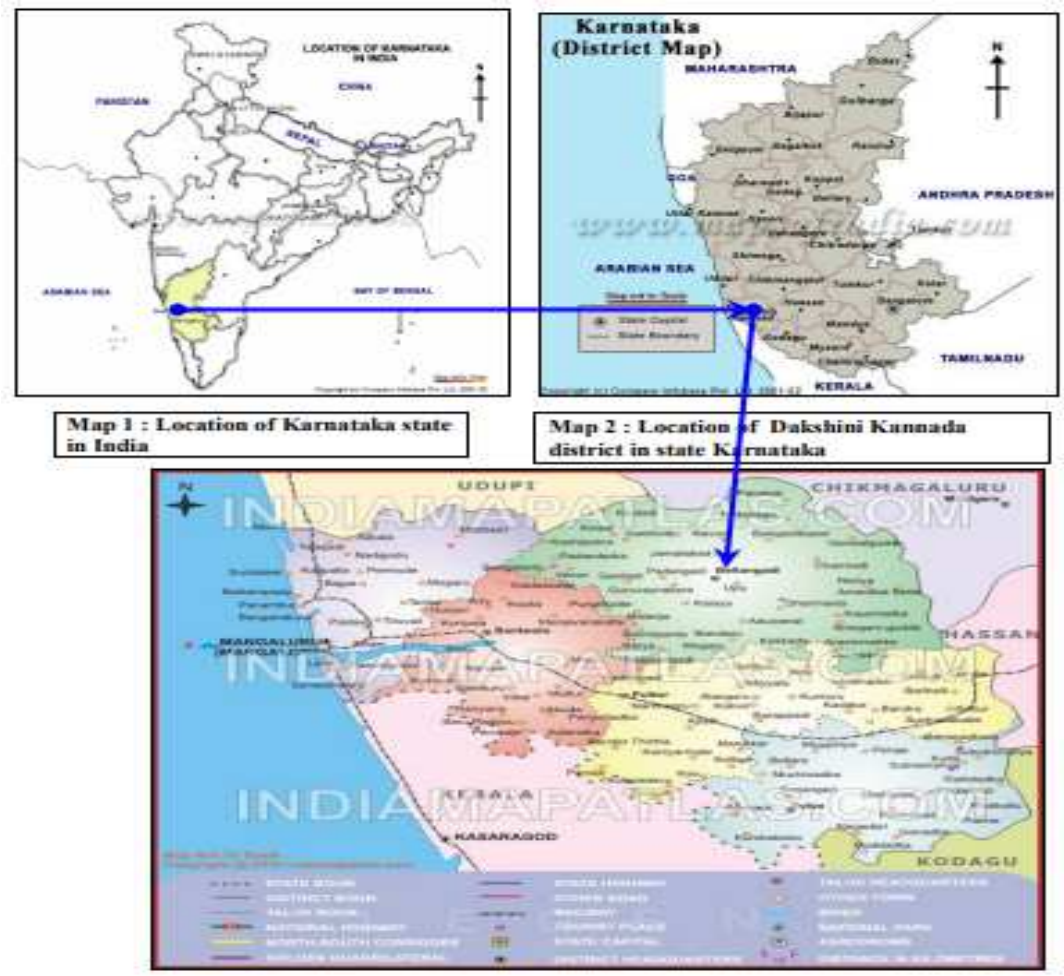
District/ State: Dakshina Kannada, Karnataka.

Village/ Taluk: Dharmasthala, Belthangady

Geographical coordinates: 12°56'07.20"N (Latitude) and 75° 22'53.87"E (longitude).

[1] https://cdm.unfccc.int/Projects/DB/DNV-CUK1200571481.71/view

[2] PP wishes not to claim GHG emissions reductions credits for period of 08 days i.e. 01-October-2008 to 08-October-2008



1.8 Title and Reference of Methodology

Methodology: AMS-I.D. Grid connected renewable electricity generation, Version 10.0(EB 28, Annex 22)

Tools referred with above methodology are:

Tool for the demonstration and assessment of Additionality - Version 04.0 (EB 36, Annex 16)

1.9 Participation under other GHG Programs

The project is also registered in CDM with UN reference no. 1549.[3]. However the project proponent has provided undertaking it would not claim GHG credits in any other GHG programs e.g. CDM other than that under VERRA in the current monitoring period.

[3] https://cdm.unfccc.int/Projects/DB/DNV-CUK1200571481.71/view

1.10 Other Forms of Credit

India is Non-annex1 country and there is no compliance with an emission trading program or to meet binding limits on GHG emissions for this project activity. PP has submitted undertaking that it would not use net GHG emission reductions by the projects for compliance with emission trading program to meet binding limits on GHG emissions. PP has also submitted undertaking for not availing other forms of environmental credit e.g. REC benefits for the same crediting period under consideration.

1.8 Sustainable Development

The Contribution to sustainable development:

Ministry of Environment, Forest and Climate Change (MoEFCC), has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

Social well-being: The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

Economic well-being: The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.

Technological well-being: The successful operation of project activity would lead to promotion of small hydro power generation and would encourage other entrepreneurs to participate in similar projects

Environmental well-being: Hydroelectric being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions.

There is no requirement of monitoring of sustainability development parameters neither according to the monitoring plan of the registered PD or host country regulation and through the above, the PP has considered that the project activity profoundly contributes to the sustainable development.

2 SAFEGUARDS

2.1 No Net Harm

The project does not involve any potential negative environmental and socio economic impacts and hence this criteria is not applicable to this project activity.

2.2 Local Stakeholder Consultation

Project Proponent had conducted local stakeholder consultation in details during the registration of the project through identification of stakeholders, invitation to them for meeting, explanation of the project to the stakeholders during the meeting and resolving comments/suggestions/grievances of the stakeholders.

The process of local stakeholder consultation is continuous. During the current monitoring period, the project proponent has kept grievance register in plant site office and sought comments/grievances/suggestions from local stakeholders including local community, government agencies and NGOs. Besides, the PP has also kept provision for submitting comments/grievances/suggestions from local stakeholders through direct mail. However, no major comments/grievances/suggestions have been received from the aforementioned stakeholders during the current monitoring period and all such minor suggestions have been take care by the PP.

2.3 AFOLU-Specific Safeguards

Not applicable to this as this is not an AFOLU project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project is conceived as a run of the river hydroelectric project and hence no storage facility such as dam is envisaged in the project design. Bhoruka Power Corporation Limited (BPCL) has implemented small hydropower project with two identical generating units of 4.5 MW capacities each totalling to 9 MW.

The project activity comprises diversion structure, power canal, fore bay, penstock, power house and power evacuation system. The powerhouse comprises two synchronous generators of capacity 4.5 MW each coupled to two numbers of horizontal 'S' type full kaplan turbines. The generated voltage at the generator terminals is 11 kV which will be stepped-up to 33 kV to match the nearest substation voltage level.

EQUIPMENT	
Turbine:	**Generator:**
Type : 'S' type horizontal full kaplan	Quantity : 02
Quantity: 02 in number.	Make : T.D Power Systems Pvt. Ltd
Capacity : 4808.21 kW	Type : Horizontal Synchronous

Rated Discharge : 30 Cumecs/ unit Rated Head : 17.5 Mtr	Rated capacity : 4500 kW Speed : 750 rpm Voltage : 11 kV Power Factor : 0.85 Frequency : 50 Hz

The project commissioned and successfully synchronization on 27-July-2006 and is in operation to till date with scheduled maintenance and operation.

There has not been any major event that may impact GHG emissions reductions of the project activity.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation is applied during the monitoring period.

3.2.2 Project Description Deviations

As per the VCS PD that referred to registered CDM PDD (UNFCCC reference 1549), there were five monitoring parameters in section B.7.1 viz. EG_y (Electricity supplied to the grid by the project), $EG_{gross,y}$ (Total electricity generated by the project during the year y), $EG_{auxiliary,y}$ (Auxiliary electricity consumption of the project), $EG_{import,y}$ (Grid electricity import to the project activity during the year y) and $F_{i,y}$ (Quantity of fossil fuel type i combusted in the project plant during year y) ; but this monitoring report referred to the revised monitoring plan in CDM (approved on 24-August-2011)[4] that mentions only four monitoring parameters

viz. $EG_{export,y}$ (Electricity exported to the grid by the project during the year y), $EG_{import,y}$ (Electricity import to the project activity during the year y), EG_y (Net electricity supplied to the grid by the project) and $F_{i,y}$ (Quantity of fossil fuel type i combusted in the project plant during year y). Hence, only these four monitoring parameters have been mentioned in section 4.2 of this monitoring report.

3.3 Grouped Projects

The project is not a grouped project thus this is not applicable.

4 DATA AND PARAMETERS

[4] https://cdm.unfccc.int/Projects/DB/DNV-CUK1200571481.71/view

4.1 Data and Parameters Available at Validation

Data / Parameter	EF_y
Data unit	tCO_2/GWh
Description	CO_2 emission factor for the regional grid system
Source of data	CEA published grid emission factors
Value applied	857
Justification of choice of data or description of measurement methods and procedures applied	Central Electricity Authority (CEA) values have been used for authenticity of the data, available publicly by Government of India with a view to obtain uniformity of approach in the country towards a common objective
Purpose of Data	Calculation of baseline emissions
Comments	The value is fixed and it is same for the entire crediting period

Data / Parameter	$COEF_i$
Data unit	$kgCO_2/TJ$
Description	CO_2 emission factor of fuel type i
Source of data	IPCC 2006 default values
Value applied	Diesel : 74000
Justification of choice of data or description of measurement methods and procedures applied	IPCC values have been used for diesel since no country specific data is available.
Purpose of Data	Calculation of project emissions
Comments	The project activity may combust only one type of fossil fuel i.e, diesel during the project operation to meet the emergency power requirement of the project. Hence only emission factor of diesel is provided in the parameter

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{export,y}$
Data unit	GWh
Description	Electricity exported to the grid by the project during the year y

<table>
<tr><td>Source of data</td><td>Joint Meter Readings (FORM-B)</td></tr>
<tr><td>Description of measurement methods and procedures to be applied</td><td>Measured

Energy exported from the project activity is measured & recorded by the energy meters

Measurement methods and procedures:

Data Typed: Measured

Monitoring: Energy Meter is used for monitoring

Archiving Policy: Paper and / Electronic</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Recorded monthly using calibrated meters and aggregated annually.</td></tr>
<tr><td>Value monitored</td><td><table><tr><td>Year</td><td>Electricity Exported to grid (GWh)</td></tr><tr><td>2011</td><td>9.91164</td></tr><tr><td>2012</td><td>19.16054</td></tr><tr><td>2013</td><td>24.66731</td></tr><tr><td>2014</td><td>20.54042</td></tr><tr><td>2015</td><td>18.63758</td></tr><tr><td>2016</td><td>6.42835</td></tr><tr><td>Total</td><td>99.34583</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td>Monitoring Equipment:

Main Meter and Check Meter. Please refer Appendix 1 for meter details and their calibration dates</td></tr>
<tr><td>QA/QC procedures to be applied</td><td>Meters are calibrated every calendar quarter as per power purchase agreement (PPA). Quantity of net electricity generation from the project is cross-checked with the invoices for the sale of electricity by Bhoruka Power Corporation Limited.</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Calculation method</td><td>Not applicable as this parameter is measured</td></tr>
</table>

Comments	The monitored Data to be kept for a minimum of two years after the end of the crediting period or the last issuance whichever is later.

Data / Parameter	$EG_{import,y}$
Data unit	GWh
Description	Electricity imported from grid by the project during the year y
Source of data	Joint Meter Readings (FORM-B)
Description of measurement methods and procedures to be applied	Measured Energy imported from the project activity is measured & recorded by the energy meters **Measurement methods and procedures:** Data Typed: Measured Monitoring: Energy Meter is used for monitoring Archiving Policy: Paper and / Electronic
Frequency of monitoring/recording	Recorded monthly using calibrated meters and aggregated annually.
Value monitored	

Year	Electricity Exported to grid (GWh)
2011	0.0120
2012	0.10765
2013	0.11316
2014	0.11934
2015	0.11263
2016	0.09929
Total	0.56409

Monitoring equipment	**Monitoring Equipment:** Main Meter and Check Meter. Please refer Appendix 1 for meter details and their calibration dates
QA/QC procedures to be applied	Meters are calibrated every calendar quarter as per power purchase agreement (PPA). Quantity of net electricity

	generation from the project is cross-checked with the invoices for the sale of electricity by Bhoruka Power Corporation Limited.
Purpose of the data	Calculation of baseline emissions
Calculation method	Not applicable as this parameter is measured
Comments	The monitored Data to be kept for a minimum of two years after the end of the crediting period or the last issuance whichever is later.

Data / Parameter	EG_y
Data unit	GWh
Description	Net electricity supplied to the grid by the project
Source of data	Joint Meter Readings (FORM-B)
Description of measurement methods and procedures to be applied	**Measurement methods and procedures:** Data Typed: Calculated Calculated from the electricity exported to grid and electricity imported from the grid values taken from Joint Meter readings (Form-B). Archiving Policy: Paper and / Electronic
Frequency of monitoring/recording	Recorded monthly using the measured values electricity exported and imported and aggregated annually.
Value monitored	
Monitoring equipment	Not applicable as this is a calculated parameter

Year	Electricity Exported to grid (GWh)
2011	9.89961
2012	19.05278
2013	24.55416
2014	20.42108
2015	18.52495
2016	6.32905
Total	98.78164

QA/QC procedures to be applied	Meters are calibrated every calendar quarter as per power purchase agreement (PPA). Quantity of net electricity generation from the project is cross-checked with the invoices for the sale of electricity by Bhoruka Power Corporation Limited.
Purpose of the data	Calculation of baseline emissions
Calculation method	The net electricity supplied to the grid is calculated as difference between the electricity exported to the grid and electricity imported from the grid to the project. $EG_y = EG_{export,y} - EG_{imports,y}$
Comments	The monitored Data to be kept for a minimum of two years after the end of the crediting period or the last issuance whichever is later.

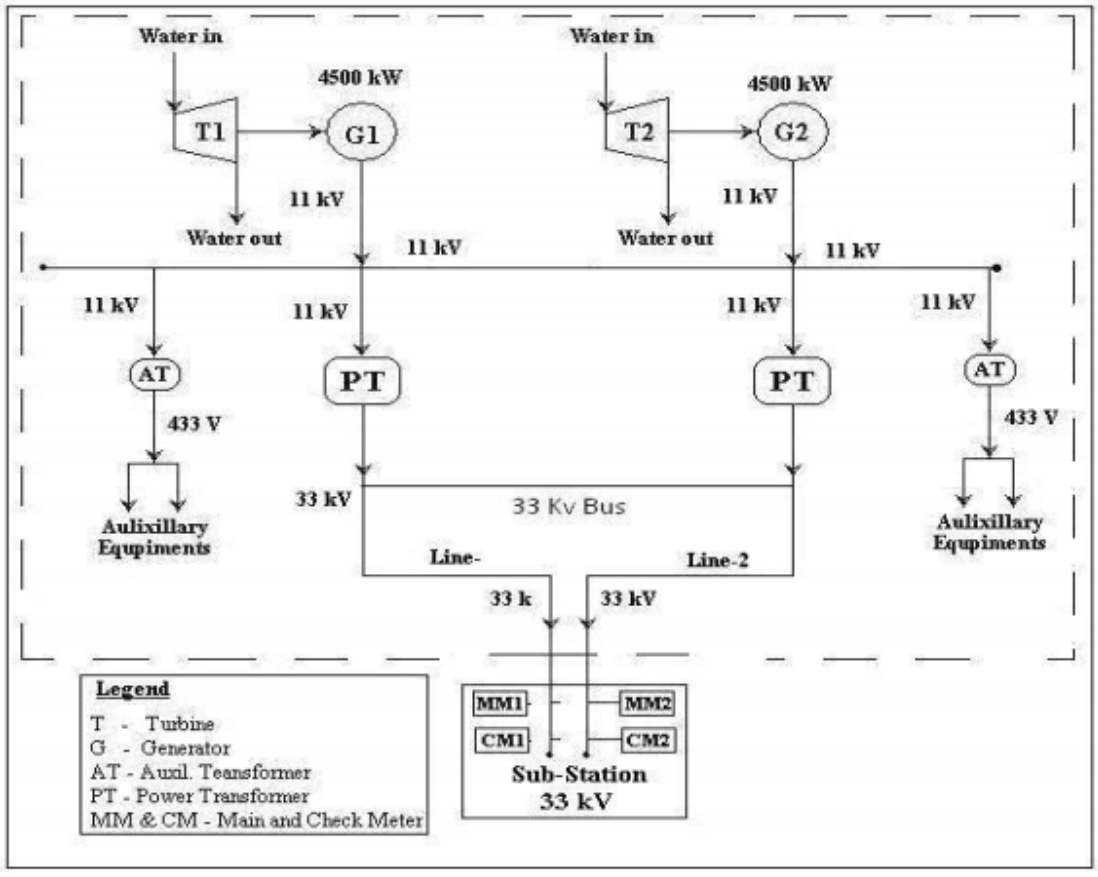
Data / Parameter	$F_{i,y}$
Data unit	Kilo Litres
Description	Quantity of fossil fuel type i combusted in the project plant during year y
Source of data	Logbook
Description of measurement methods and procedures to be applied	Fossil fuel (diesel) consumption by the project activity is measured by Glass gauge provided on the storage tank and recorded in logbook **Measurement methods and procedures:** Data Typed: Measured Monitoring: Glass gauge is used for monitoring Archiving Policy: Paper and / Electronic
Frequency of monitoring/recording	Recorded daily in a logbook maintained at project site
Value monitored	

Year	Fossil Fuel (Diesel) Consumption) (Kilo Litres)
2011	0.145
2012	0.483
2013	0.371
2014	0.583
2015	0.557

	2016 | 0.298 Total | 2.437
Monitoring equipment	**Monitoring Equipment:** Glass gauge provided on the storage tank
QA/QC procedures to be applied	The data recorded will be cross checked against the fuel purchase receipts
Purpose of the data	Calculation of project emissions
Calculation method	Not applicable as this parameter is measured
Comments	The monitored Data to be kept for a minimum of two years after the end of the crediting period or the last issuance whichever is later.

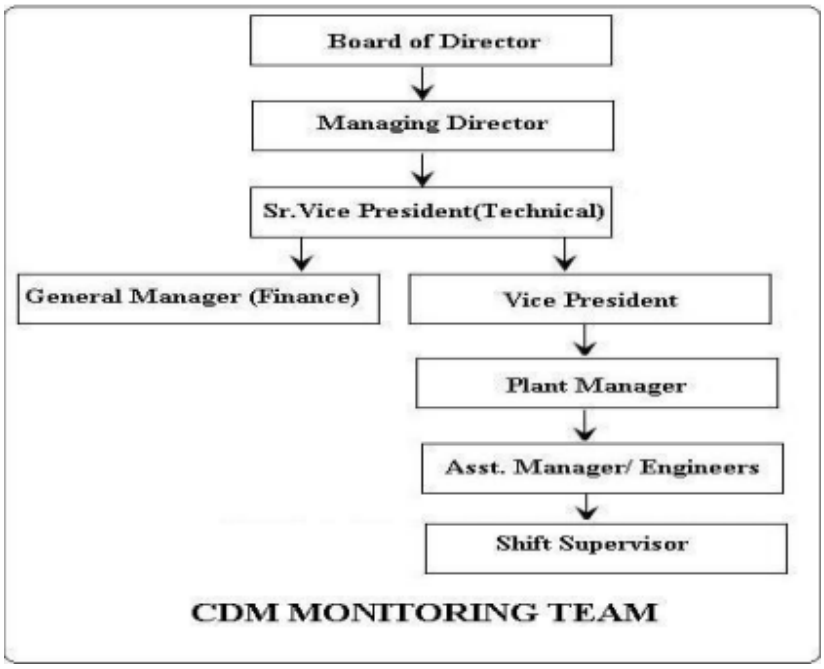
4.3 Monitoring Plan

The project was provided with the monitoring equipments which were described in the registered CDMPDD and the line diagram for the monitoring parameters is furnished below:



Monitoring Team

A CDM team has been formed in Bhoruka Power Corporation Limited (BPCL) for monitoring and verification of all the monitoring parameters as per the guidelines formulated by the management of BPCL. Qualified and trained people monitor the parameters and emission reduction calculations. BPCL is the sole agency responsible for implementation and monitoring of the project activity. The monitoring organization structure is shown below:



Board of Directors

The Board of directors is responsible for entire monitoring plan. They review the reports submitted by Managing director.

Managing Director

The Managing Director will examine the reports generated by Vice president (Technical) He in particular takes note of any deviations in data over the norms and monitor that the corrective actions have resulted in adherence to standards.

Vice President (technical)

Vice president is responsible for all the technical aspects. He examines the reports generated by Vice president (O&M) and General Manager (Finance) He is responsible for registration, monitoring, measurement, reporting and reviewing of the data of the CDM activity. He undertakes periodic verification and onsite inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions.

Vice president (O&M)

Vice president is responsible for Operation and maintenance of running plants. He is assisted by Plant manager. He will examine the reports generated by the Plant Manager with

respect to the monthly electricity generation, export, import and annual emission reduction calculations as per the monitoring plan. He is also responsible for reviewing of the data regarding GHG emissions submitted by Plant manager.

Plant manager
Plant manager monitors activities of GHG and preparation of necessary reports, for review by the management, the responsibilities rest with concerned plant manager. He is also responsible for storage and archiving of information in good condition also lies with Plant Manager. He also examines the reports generated by the shift Supervisor with respect to the monthly electricity generation, export, import and annual emission reduction calculations as per the monitoring plan. The calibration of the meters installed will be taken care by him as per the monitoring plan.

Shift Supervisor
Shift Supervisor is responsible for recording the electricity meter readings at project site on daily basis. He is also responsible to take note of net export power to grid, plant shut down times, if any etc. The monthly reports are generated and submitted to the Plant manager for verification.

The generated energy is measured by two main meters and two check meters. Calibration of the meters is carried out by KPTCL as per the PPA, every quarter. The meters are deemed to be working satisfactorily if the errors are within the meter specifications of 0.2s accuracy class.

Emergency Procedures
The project has necessary provisions for emergency preparedness so that any unforeseen events such as fire etc. could be averted. The provisions include firefighting systems, standby features for critical items etc.

Methods of data transfer and archiving policy:
The electricity exported to grid and electricity imported from the grid recorded at grid substation, which is under the control of KPTCL. The electrical energy was measured using calibrated meters and recorded at the KPTCL Sub-station. Records of measurements were used for verification of emissions reductions.

Sales bills / receipts were used for cross verification of electricity to / from grid as an alternative proof of the electricity exported to the grid. All the data monitored under the monitoring plan will be kept in electronic form and hard copy format for 2 years after the end of crediting period or the last issuance of VCUs for this project activity whichever occurs later.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions are calculated based on the net energy provided to the grid (in MWh/year) and an emission factor for the displaced grid electricity (in tCO_2/MWh).

$BE_y = EG_y * EF_y$

Where,

EG_y = net electricity supplied to to the grid by the project (GWh)

EF_y =the emission factor of the grid to which the project exports electricity (CO_2 emission factor for the regional grid system)(tCO2/GWh)

The baseline emission factor in year y is calculated as the simple average of the OM and BM emission factors, i.e. OM and BM are each weighted with 50%. As noted above, the resulting Combined Margin is fixed ex ante for the duration of the crediting period. The project has been considered the validated baseline emission factor (Ex-ante) i.e. 857 tCO_2/GWh or 0.857 tCO_2/MWh and the same is used as the constant baseline emission factor for the project activity during the crediting period.

The calculation of yearly baseline emissions is provided in the table below:

Year	**Net Electricity Export(GWh)**	**Baseline Emission Factor(tCO_2/GWh)**	**Baseline Emissions(tCO_2)**
2011	9.89961	857	8,483
2012	19.05278	857	16,328
2013	24.55416	857	21,042
2014	20.42108	857	17,500
2015	18.52495	857	15,875
2016	6.32905	857	5,424
Total	**98.78164**		**84,652**

Hence, Baseline Emissions (BE_y) = 84,652 tCO_2 (Round-down value)

5.2 Project Emissions

Though the project is equipped with diesel generator to meet the emergency requirements of power house etc. and there can be project emissions due to usage of diesel (fossil fuel), the usage during the current monitoring period is

As the project is equipped with diesel generator to meet the emergency requirements of power house etc. emissions out of usage of fossil fuel (diesel) are being accounted as project emissions by using the following equation.

$PE_y = F_{i,y} \times COEF_i$

Where,

PE_y : Project emissions from combustion of fossil fuel (diesel for DG set) in the project activity during the year y(tCO_2)

$F_{i,y}$: Quantity of fossil fuel type i combusted (DG set) during the year y(litre)

$COEF_i$: Carbon dioxide emission coefficient of the fuel type ($kgCO_2/TJ$)

$COEF_i = NCV_i \times EF_{CO2,i}$

Where,

NCV_i: Net calorific value of diesel (43.3 TJ/Gg as per IPCC 2006[5], Volume-2, Table-1.2 @

95% Confidence interval upper limit value is considered)

$EFCO_{2,i}$: CO_2 emission factor of Diesel (74000 $kgCO_2/TJ$ or 74.0 tCO_2/TJ as per CDM PDD UNFCCC ref id 1549[6]

Therefore, $COEF_i$ = 43.3 x 74.0 = 3,204.2 / 1000000 = 0.0032042 tCO_2 /kg

Density of diesel = 0.845 kg/Litre as per Society of Indian Automobile Mfgs[7]

During the current monitoring period, diesel consumption ($F_{i,y}$) and project emissions are:

Year	Fossil Fuel(Diesel) Consumption (Kilo Litre)	Fossil Fuel(Diesel) Consumption (Litre)	Density of Diesel(kg/ Litre)	$COEF_i$ (tCO_2/kg)	Project Emissions(tCO_2)
2011	0.145	145.00	0.845	0.00324	1.00
2012	0.483	483.00	0.845	0.00324	2.00
2013	0.371	371.00	0.845	0.00324	2.00
2014	0.583	583.00	0.845	0.00324	2.00
2015	0.557	557.00	0.845	0.00324	2.00
2016	0.298	298.00	0.845	0.00324	1.00
Total	**2.437**	**2437.00**	**--**	**--**	**10.00**

Hence Project Emissions (PE_y) = 10.00 tCO_2e (Round-up value)

[5] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

[6] https://cdm.unfccc.int/Projects/DB/DNV-CUK1200571481.71/view

[7] http://www.siamindia.com/scripts/Diesel.aspx

5.3 Leakage

No leakage emissions are considered for this project activity.

5.4 Net GHG Emission Reductions and Removals

The Formula used to calculate the net emission reduction for the project activity is

$ER_y = BE_y – PE_y$

Where,

ER_y = Emission Reduction in tCO_2/year

BE_y = Baseline emission in tCO_2/year

PE_y = Project emissions in tCO_2/year

For the project activity during the current monitoring period, as per section 5.1

BE_y = 84,652 tCO_2

PE_y = 10 tCO_2
LE_y = 0 tCO_2.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2011	8,483	1	0	8,482
2012	16,328	2	0	16,326
2013	21,042	2	0	21,040
2014	17,500	2	0	17,498
2015	15,875	2	0	15,873
2016	5,424	1	0	5,423
Total	84,652	10	0	84,642

The actual VERs are about 13.6% less than the estimated VERs. This variation is majorly due to the variations in water availability which is dependent on rainfall, grid availability and other parameters which are not in the control of PP.

APPENDIX 1: METER CALIBRATION DETAILS

Meter Details

Parameter	Line 1		Line 2	
	Main Meter	**Check Meter**	**Main Meter**	**Check Meter**
Type	ERP 300P	ERP 300P	ERP 300P	ERP 300P
Make	L & T	L&T	L & T	L& T
Accuracy Class	0.2s	0.2s	0.2s	0.2s
Serial No.	10039548 (01-September-2011 to 31-May-2016) 16195520 (01-June-2016 onwards)[8]	10059254(01-September-2011 to 31-May-2016) 16195538(01-June-2016 onwards)	10039546	10039553
Calibration Frequency	Calibration of the meters is carried out by KPTCL as per the PPA - once in every quarter.			

Calibration details

Line 1

Main Meter (10039548)		Check Meter (10059254)	
Calibration date	Validity till	Calibration date	Validity till
05-November-2012	04-February-2013	05-November-2012	04-February-2013
11-January-2013	10-April-2013	11-January-2013	10-April-2013
07-April-2013	06-July-2013	07-April-2013	06-July-2013
03-July-2013	02-October-2013	03-July-2013	02-October-2013
03-October-2013	02-January-2014	03-October-2013	02-January-2014
04-January-2014	03-April-2014	04-January-2014	03-April-2014
09-April-2014	08-July-2014	09-April-2014	08-July-2014
07-October-2014	06-January-2015	07-October-2014	06-January-2015
08-January-2015	07-April-2015	08-January-2015	07-April-2015

[8] New meters installed for line 1; relevant document for replacement of meter has been provided to verification team

11-April-2015	10-July-2015	11-April-2015	10-July-2015
09-July-2015	08-October-2015	09-July-2015	08-October-2015
15-October-2015	14-January-2016	15-October-2015	14-January-2016
26-May-2016(new meter installed, serial no. 16195520)	25-August-2016	26-May-2016(new meter installed, serial no. 16195538)	25-August-2016

Line 2

Main Meter(serial no. 10039456)		Check Meter(serial no. 10039553)	
Calibration date	Validity till	Calibration date	Validity till
03-July-2013	02-October-2013	03-July-2013	02-October-2013
03-October-2013	02-December-2013	03-October-2013	02-December-2013
04-January-2014	03-April-2014	04-January-2014	03-April-2014
04-July-2014	03-October-2014	04-July-2014	03-October-2014
07-October-2014	06-January-2015	07-October-2014	06-January-2015
09-July-2015	08-October-2015	09-July-2015	08-October-2015
15-October-2015	14-January-2016	15-October-2015	14-January-2016
26-May-2016	25-August-2016	26-May-2016	25-August-2016

Considering the frequency of meter calibration as once in every quarter, there have been delays in calibration of meters – both Line 1 and Line 2.

Delay in calibration

Line 1	Line 2
01-September-2011 to 04-November-2012	01-September-2011 to 02-July-2013
03-January-2014	03-December-2013 to 03-January-2014
04-April-2014 to 08-April-2014	04-April-2014 to 03-July-2014
09-July-2014 to 06-October-2014	04-October-2014 to 06-October-2014
07-January-2015	07-January-2015 to 08-July-2015
08-April-2015 to 10-April-2015	09-October-2015 to 14-October-2015
09-October-2015 to 14-October-2015	15-January-2016 to 25-May-2016
15-January-2016 to 25-May-2016	

Hence, conservative error factor of 0.2% has been applied for complete month of delayed calibration period on the values of export and import in case of Line 1 for the months – September 2011 to November 2012, January 2014, April 2014, July 2014 to October 2014, January 2015, April 2015, October 2015, January 2016 to May 2016 and in case of Line 2 for the months – September 2011 to July 2013, December 2013 to January 2014, April 2014 to July 2014, October 2014, January 2015 to July 2015, October 2015, January 2016 to May 2016.